CALIFORNIA 2010 GREEN BUILDING STANDARDS CODE

CALGreen

California Code of Regulations
Title 24, Part 11

California Building Standards Commission

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CALIFORNIA BUILDING STANDARDS COMMISSION
CBSC

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2010 California Green Building Standards Code
California Code of Regulations, Title 24, Part 11

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PREFACE

This document is the 11th of 12 parts of the official compilation and publication of the adoptions, amendments and repeal of regulations to *California Code of Regulations*, Title 24, also referred to as the *California Building Standards Code*. This Part is known as the *California Green Building Standards Code*, and it is intended that it shall also be known as the *CALGreen Code.*

The *California Building Standards Code* is published in its entirety every three years by order of the California Legislature. The California Legislature delegated authority to various State agencies, boards, commissions and departments to create building regulations to implement the State's statutes. These building regulations or standards have the same force of law, and take effect 180 days after their publication unless otherwise stipulated. The *California Building Standards Code* applies to all occupancies in the State of California as annotated.

A city, county, or city and county may establish more restrictive standards reasonably necessary because of local climatic, geological or topographical conditions. For the purpose of this code, these conditions include local environmental conditions as established by a city, county, or city and county. Findings of the local condition(s) and the adopted local building standard(s) must be filed with the California Building Standards Commission to become effective and may not be effective sooner than the effective date of this edition of the *California Building Standards Code*. Local building standards that were adopted and applicable to previous editions of the *California Building Standards Code* do not apply to this edition without appropriate adoption and the required filing.

Should you find publication (e.g., typographical) errors or inconsistencies in this code or wish to offer comments toward improving its format, please address your comments to:

California Building Standards Commission
2525 Natomas Park Drive, Suite 130
Sacramento, CA 95833-2936
Phone: (916) 263-0916
Fax: (916) 263-0959

Website: www.bsc.ca.gov

ACKNOWLEDGMENTS

The 2010 *California Green Building Standards Code* (Code) was developed through the outstanding collaborative efforts of the Department of Housing and Community Development, the Division of State Architect, the Office of the State Fire Marshal, the Office of Statewide Health Planning and Development, the California Energy Commission, and the Building Standards Commission (Commission).

This collaborative effort included the assistance of the Commission's Code Advisory Committees and many other volunteers that worked tirelessly to assist the Commission in the production of this Code.

Governor Arnold Schwarzenegger

Members of the Building Standards Commission

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Craig Dailey
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Steven Winkel

David Walls – Executive Director
Thomas Morrison – Deputy Executive Director

For questions on California state agency amendments; please refer to the contact list on the following page.

LEGEND FOR AGENCY ADOPTIONS

Unless otherwise noted, state agency adoptions are indicated by the following banners in the section leaders:

Department of Housing and Community Development: **[HCD]**

California Building Standards Commission: **[BSC]**

Division of the State Architect, Structural Safety: **[DSA-SS]**

Office of Statewide Health Planning and Development: **[OSHPD 1, 2 & 4]**

See Chapter 1, Sections 103–106 for applications regulated by the respective state agencies.

EFFECTIVE USE OF THIS CODE

The format of this code is common to other parts of the *California Building Standards Code* and contains building standards applicable to occupancies which fall under the authority of different state agencies. Occupancies and applications under the authority of a specific state agency are identified in Chapter 1, Sections 103 through 106. Sections of this code which are applicable and adopted by each state agency are identified in the Matrix Adoption Tables located at the beginning of each chapter. The following outline is provided as a guide to establish which provisions 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 required 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.

California Code of Regulations, Title 24

California Agency Information Contact List

California Energy Commission

Energy Hotline. . . . . (800) 772-3300
. . . . . or (916) 654-5106
Building Efficiency Standards
Appliance Efficiency Standards
Compliance Manual/Forms

California State Lands Commission

Marine Oil Terminals . . . . . (562) 499-6317

California State Library

Resources and Information . . . . . (916) 654-0261
Government Publication Section. . . . . (916) 654-0069

Corrections Standards Authority

Local Adult Jail Standards . . . . . (916) 324-1914
Local Juvenile Facility Standards . . . . . (916) 324-1914

Department of Consumer Affairs – Acupuncture Board

Office Standards . . . . . (916) 445-3021

Department of Consumer Affairs – Board of Pharmacy

Pharmacy Standards . . . . . (916) 574-7900

Department of Consumer Affairs – Bureau of Barbering And Cosmetology

Barber and Beauty Shop and
College Standards . . . . . (916) 574-7570
. . . . . (800) 952-5210

Department of Consumer Affairs – Bureau of Home Furnishings and Thermal Insulation

Insulation Testing Standards . . . . . (916) 574-2041

Department of Consumer Affairs – Structural Pest Control Board

Structural Standards . . . . . (800) 737-8188
. . . . . (916) 561-8708

Department of Consumer Affairs – Veterinary Medical Board

Veterinary Hospital Standard . . . . . (916) 263-2610

Department of Food and Agriculture

Meat and Poultry Packing Plant
Standards. . . . . (916) 654-1447
Dairy Standards. . . . . (916) 654-1447

Department of Public Health

Organized Camps Standards. . . . . (916) 449-5661
Public Swimming Pools Standards . . . . . (916) 449-5693
Asbestos Standards . . . . . (510) 620-2874

Department of Housing and Community Development

Residential – Hotels, Motels, Apartments,
Single-Family Dwellings . . . . . (916) 445-9471
Permanent Structures in Mobilehome and
Special Occupancy Parks. . . . . (916) 445-9471
Factory-Built Housing, Manufactured
Housing and Commercial Modular . . . . . (916) 445-3338
Mobilehomes – Permits and Inspections
Northern Region. . . . . (916) 225-2501
Southern Region. . . . . (951) 782-4420
Employee Housing Standards . . . . . (916) 445-9471

Department of Water Resources

Gray Water Installations Standards . . . . . (916) 651-9667

Division of the State Architect – Access Compliance

Access Compliance Standards. . . . . (916) 445-8100

Division of the State Architect – Structural Safety

Public Schools Standards . . . . . (916) 445-8100
Essential Services Building Standards . . . . . (916) 445-8100
Community College Standards . . . . . (916) 445-8100

Division of the State Architect – State Historical Building Safety Board

Alternative Building Standards . . . . . (916) 445-8100

Office of Statewide Health Planning and Development

Hospital Standards . . . . . (916) 440-8409
Skilled Nursing Facility Standards . . . . . (916) 440-8409
Clinic Standards . . . . . (916) 440-8409
Permits. . . . . (916) 440-8409

Office of the State Fire Marshal

Code Development and Analysis. . . . . (916) 445-8200
Fire Safety Standards. . . . . (916) 445-8200
Fireplace Standards. . . . . (916) 445-8200
Day-Care Centers Standards. . . . . (916) 445-8200
Exit Standards . . . . . (916) 445-8200

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CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 1 – ADMINISTRATION

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	**X**		**X**				**X**	**X**	**X**		**X**								
Chapter/Section																			
101	X		X				X	X	X		X								
102	X		X				X	X	X		X								
103	X																		
104			X																
105							X												
106								X	X		X								

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *California Green Building Standards Code* and may be cited as such and will be referred to herein as "this code." It is intended that it shall also be known as the *CALGreen* Code. The *California Green Building Standards Code* is Part 11 of twelve parts of the official compilation and publication of the adoption, amendment and repeal of building regulations to the *California Code of Regulations*, Title 24, also referred to as the *California Building Standards Code*.

101.2 Purpose. 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 building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories:

1. Planning and design
2. Energy efficiency
3. Water efficiency and conservation
4. Material conservation and resource efficiency
5. Environmental quality

101.3 Scope. The provisions of this code shall apply to the planning, design, operation, construction, use and occupancy of every newly constructed building or structure, unless otherwise indicated in this code, throughout the State of California.

It is not the intent that this code substitute or be identified as meeting the certification requirements of any green building program.

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

1. State-owned buildings, including buildings constructed by the Trustees of the California State University, and to the extent permitted by California law, buildings designed and constructed by the Regents of the University of California and regulated by the Building Standards Commission. See Section 103 for additional scoping provisions.
2. Energy efficiency standards regulated by the California Energy Commission.
3. Low-rise residential buildings constructed throughout the State of California, including but not limited to, hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilets or cooking facilities regulated by the Department of Housing and Community Development. See Section 104 for additional scoping provisions.
4. Public elementary and secondary schools, and community college buildings regulated by the Division of

the State Architect. See Section 105 for additional scoping provisions.

5. Qualified historical buildings and structures and their associated sites regulated by the State Historical Building Safety Board within the Division of the State Architect.
6. General acute care hospitals, acute psychiatric hospitals, skilled nursing and/or intermediate care facilities, clinics licensed by the Department of Public Health and correctional treatment centers regulated by the Office of Statewide Health Planning and Development. See Section 106 for additional scoping provisions.
7. Graywater systems regulated by the Department of Water Resources and the Department of Housing and Community Development.

101.4 Appendices. Provisions contained in the appendices of this code are not mandatory unless specifically adopted by a State agency or adopted by a city, county, or city and county in compliance with *Health and Safety Code* Sections 18930 and 18941.5, respectively, for Building Standards Law; *Health and Safety Code* Section 17950 for State Housing Law; and *Health and Safety Code* Section 13869.7 for Fire Protection Districts. See Section 101.7 of this code.

101.5 Referenced codes and standards. The codes and standards referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

101.5.1 Building. The provisions of the *California Building Code* and *California Residential Code*, as applicable, shall apply to the construction, alteration, movement, enlargement, replacement, repair, use and occupancy, location, maintenance, removal and demolition of every structure or any appurtenances connected or attached to such buildings or structures.

101.5.2 Electrical. The provisions of the *California Electrical Code* shall apply to the installation of electrical systems, including but not limited to, alterations, repair, replacement, equipment, appliances, fixtures, fittings and appurtenances thereto.

101.5.3 Mechanical. The provisions of the *California Mechanical Code* shall apply to the installation, alterations, repair and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

101.5.4 Plumbing. The provisions of the *California Plumbing Code* shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances where connected to a water or sewage system.

101.5.5 Fire prevention. The provisions of CCR, Title 19, Division 1 and CCR, Title 24, Part 2 and Part 9 relating to fire and panic safety as adopted by the Office of the State Fire Marshal shall apply to all structures, processes and premises for protection from the hazard of fire, panic and explosion.

101.5.6 Energy. The provisions of the *California Energy Code* shall apply to the minimum design and construction of buildings for energy efficiency.

101.6 Order of precedence and use.

101.6.1 Differences. In the event of any differences between these building standards and the standard reference documents, the text of these building standards shall govern. In the event a local amendment to this code results in differences between these building standards and the amendment, the text of the amendment shall govern.

101.6.2 Specific provision. Where a specific provision varies from a general provision, the specific provision shall apply.

101.6.3 Conflicts. When the requirements of this code conflict with the requirements of any other part of the *California Building Standards Code*, Title 24, the most restrictive requirement shall prevail.

101.6.4. Explanatory notes. Explanatory material, such as references to websites or other sources where additional information may be found, is included in this code in the form of notes. Notes are informational only and are not enforceable requirements of this code.

101.7 City, county, or city and county amendments, additions or deletions. This code is intended to set mandatory minimum Green Building Standards and includes optional tiers that may, at the discretion of any city, county, or city and county, be applied.

This code does not limit the authority of city, county, or city and county governments to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1. The effective date of amendments, additions, or deletions to this code for cities, counties, or cities and counties filed pursuant to Section 101.7.1 shall be the date on which it is filed. However, in no case shall the amendments, additions or deletions to this code be effective any sooner than the effective date of this code.

Local modifications shall comply with *Health and Safety Code* Section 18941.5(b) for Building Standards Law, *Health and Safety Code* Section 17958.5 for State Housing Law or *Health and Safety Code* Section 13869.7 for Fire Protection Districts.

101.7.1 Findings and filings.

1. The city, county, or city and county shall make express findings for each amendment, addition or deletion based upon climatic, topographical or geological 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 1800 3rd Street, Room 260, Sacramento, CA 95811.

4. The city, county, or city and county shall obtain California Energy Commission approval for any energy-related ordinances consistent with *Public Resources Code* Section 25402.1(h)(2) and Title 24, Part 1, Section 10-106. Local governmental agencies may adopt and enforce energy standards for newly constructed buildings, additions, alterations and repairs, provided the California Energy Commission finds that the standards will require buildings to be designed to consume no more energy than permitted by Part 6. Such local standards include, but are not limited to, adopting the requirements of Part 6 before their effective date, requiring additional energy conservation measures, or setting more stringent energy budgets.

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

1. Section 1.2.2 in the *California Building Code* (CBC) for the California Building Standards Commission.

2. Section 104.11 of Chapter 1, Division II for the Division of the State Architect.

3. Section 1.8.7, Chapter 1, Administration, Division 1, of the 2010 *California Building Code* and Section 1.2.6, Chapter 1, Administration, Division 1, of the 2010 *California Residential Code* for the Department of Housing and Community Development.

4. Section 7-104, 2010 *California Administrative Code* for the Office of the Statewide Health Planning and Development.

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

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

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

1. Establish the type of occupancy.

2. Verify which state agency has authority for the established occupancy by reviewing the authorities list in Sections 103 through 106.

3. Once the appropriate agency has been identified, find the chapter which covers the established occupancy.

4. The Matrix Adoption Tables at the beginning of Chapters 4 and 5 identify the mandatory green building measures necessary to meet the minimum requirements of this code for the established occupancy.

5. Voluntary tier measures are contained in Appendix Chapters A4 and A5. A checklist containing each green building measure, both required and voluntary, is provided at the end of each appendix chapter. Each measure listed in the application checklist has a section number which correlates to a section where more information about the specific measure is available.

6. The application checklist identifies which measures are required by this code and allows users to check off which voluntary items have been selected to meet voluntary tier levels if desired or mandated by a city, county, or city and county.

SECTION 102
CONSTRUCTION DOCUMENTS AND INSTALLATION VERIFICATION

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

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

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

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

SECTION 103
BUILDING STANDARDS COMMISSION

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

1. **All occupancies.**

   Application—New construction, unless otherwise indicated in this code, of State buildings (all occupancies), including buildings constructed by the Trustees of the California State University and the Regents of the University of California and all occupancies where no state agency has the authority to adopt building standards applicable to such buildings.

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

   Authority cited—*Health and Safety Code* Sections 18930.5, 18934.5 and 18938 (b).

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

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

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

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

   Authority cited—*Government Code* Section 14617.

   Reference—*Government Code* Section 14617.

3. **Existing State-Owned Buildings, including those owned by the University of California and by the California State University.**

   Application—Building seismic retrofit standards including abating falling hazards of structural and nonstructural components and strengthening of building structures. See also Division of the State Architect.

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

   Authority cited—*Government Code* Section 16600.

   Reference—*Government Code* Sections 16600 through 16604.

4. **Unreinforced Masonry Bearing Wall Buildings.**

   Application—Minimum seismic strengthening standards for buildings specified in Appendix Chapter 1 of the *California Code for Building Conservation*, except for buildings subject to building standards adopted pursuant to Part 1.5 (commencing with Section 17910).

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

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

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

SECTION 104
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

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

1. **Housing construction.**

   Application—Hotels, motels, lodging houses, apartment houses, dwellings, dormitories, condominiums, shelters for homeless persons, congregate residences, employee housing, factory-built housing and other types of dwellings containing sleeping accommodations with or without common toilet or cooking facilities including accessory buildings, facilities and uses thereto. Sections of this code which pertain to applications listed in this section are identified in the Matrix Adoption Table using the abbreviation "HCD 1."

   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 construction on a new campus site or new construction on an existing site cleared of all existing structures.

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

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

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

105.1.2 Applicable administrative standards.

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

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

SECTION 106
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

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

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

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

106.1.1 Applicable administrative standards.

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

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

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

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

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

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

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

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

106.2.1 Applicable administrative standards.

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

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

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

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

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

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

Application—Correctional treatment centers.

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

106.3.1 Applicable administrative standards.

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

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

106.3.3 Identification of amendments. For applications listed in Section 106.4, amendments appear in this code preceded with the acronym [OSHPD 4], unless the entire chapter is applicable.

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

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

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter	**X**		**X**																
Adopt entire chapter as amended (amended sections listed below)								**X**	**X**		**X**								
Adopt only those sections that are listed below							**X**												
Chapter/Section																			
201							X												
202 AUTOMATIC							X												
202 BUILDING ENVELOPE							X												
202 CALIFORNIA BUILDING CODE							X												
202 CALIFORNIA ELECTRICAL CODE							X												
202 CALIFORNIA ENERGY CODE							X												
202 CALIFORNIA MECHANICAL CODE							X												
202 CALIFORNIA PLUMBING CODE							X												
202 CALIFORNIA RESIDENTIAL CODE								†	†		†								
202 CONDITIONED SPACE							X												
202 COOLING EQUIPMENT							X												
202 ENERGY COMMISSION							X												
202 ENFORCING AGENCY							X												
202 GREEN BUILDING							X												
202 INFILTRATION							X												
202 KITCHEN							X												
202 LOW-RISE RESIDENTIAL BUILDING							X	†	†		†								
202 OUTDOOR AIR (Outside air)							X												
202 PLANTS								†	†		†								
202 RESIDENTIAL BUILDING							X	†	†		†								
202 RESILIENT FLOORING							X	†	†		†								
202 VAPOR BARRIER							X												

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

AUTOMATIC. Automatic means capable of operating without human intervention.

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*.

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.

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

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.

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

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

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.

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

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.

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.

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.

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.

LOW-RISE RESIDENTIAL BUILDING. A building that is of Occupancy Group R and is three stories or less, or that is a one- or two-family dwelling or townhouse.

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

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

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.

PROCESS SPACE. A space that is thermostatically controlled to maintain a process environment temperature less than 55ºF or to maintain a process environment temperature greater than 90º 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 55º F or incapable of operating at temperatures below 90º F at design conditions.

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.

RESIDENTIAL BUILDING. See "low-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

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.

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

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 3 – GREEN BUILDING

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

CHAPTER 3
GREEN BUILDING

SECTION 301
GENERAL

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

SECTION 302
MIXED OCCUPANCY BUILDINGS

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

SECTION 303
PHASED PROJECTS

303.1 Phased projects. For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

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

SECTION 304
VOLUNTARY TIERS

304.1 Purpose. Voluntary tiers are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment and promote a more sustainable design.

304.1.1 Tiers. The provisions of Appendices A4 and A5 outline means of achieving enhanced construction levels by incorporating additional measures. Buildings complying with tiers specified for each occupancy contain additional prerequisite and elective green building measures necessary to meet the threshold of each tier.

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

SECTION 305
CALGREEN TIER 1 AND CALGREEN TIER 2

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

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

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

SECTION 306
VOLUNTARY MEASURES

306.1 Purpose. Voluntary measures are intended to further encourage building practices that improve public health, safety and general welfare by promoting the use of building concepts which minimize the building's impact on the environment, promote a more sustainable design and high-performance educational facilities.

306.1.1 The provisions of Appendix A5 outline means of achieving enhanced construction levels by incorporating additional measures.

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

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				CSA	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																			

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

Division 4.1 – PLANNING AND DESIGN

SECTION 4.101
GENERAL

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

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.

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.

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 Surface drainage. The site shall be planned and developed to keep surface water from entering buildings. Construction plans shall indicate how the site grading or drainage system will manage surface water flows. 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

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

Division 4.2 – ENERGY EFFICIENCY

SECTION 4.201
GENERAL

4.201.1 Scope. The Department of Housing and Community Development does not regulate mandatory energy efficiency standards in residential buildings. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

Note: It is the intent of this code to encourage buildings to achieve exemplary performance in the area of energy efficiency. For the purposes of energy efficiency standards, the California Energy Commission believes specifically, a green building should achieve at least a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards. The Department of Housing and Community Development's mandatory green building standards for residential buildings do not require compliance with levels of minimum energy efficiency beyond those required by the California Energy Commission.

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

SECTION 4.303
INDOOR WATER USE

4.303.1 Twenty percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by at least 20 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the *California Building Standards Code*. The 20 percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Each plumbing fixture and fitting shall meet reduced flow rates specified in Table 4.303.2; or
2. A calculation demonstrating a 20 percent reduction in the building "water use" baseline as established in Table 4.303.1 shall be provided. For low-rise residential occupancies, the calculation shall be limited to the following plumbing fixture and fitting types: water closets, urinals, lavatory faucets and showerheads.

4.303.2 Multiple showerheads serving one shower. When single shower fixtures are served by more than one showerhead, the combined flow rate of all the showerheads shall not exceed the maximum flow rates specified in the 20 percent reduction column contained in Table 4.303.2 or the shower shall be designed to only allow one showerhead to be in operation at a time.

Exception: The maximum flow rate for showerheads when using the calculation method specified in Section 4.303.1, Item 2, is 2.5 gpm @ 80 psi.

4.303.3 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 4.303.3.

TABLE 4.303.1
WATER USE BASELINE[1]

FIXTURE TYPE	FLOW RATE[2]	DURATION	DAILY USES	OCCUPANTS[3]
Showerheads, residential	2.5 gpm @ 80 psi	8 min.	1	
Lavatory faucets, residential	2.2 gpm @ 60 psi	.25 min.	3	
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	
Replacement aerators	2.2 gpm @ 60 psi			
Gravity tank-type water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[4] 3 female	
Urinals	1.0 gallon/flush	1 flush	2 male	

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

1. Use Worksheet WS-1 to calculate baseline water use.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20, *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
4. The daily use number shall be increased to three if urinals are not installed in the room.

TABLE 4.303.2
FIXTURE FLOW RATES

FIXTURE TYPE	FLOW RATE	MAXIMUM FLOW RATE AT ≥ 20 percent REDUCTION
Showerheads	2.5 gpm @ 80 psi	2 gpm @ 80 psi
Lavatory faucets, residential	2.2 gpm @ 60 psi	1.5 gpm @ 60 psi[2]
Kitchen faucets	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Gravity tank-type water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer tank water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer valve water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Electromechanical hydraulic water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Urinals	1.0 gallon/flush	.5 gallon/flush

1. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.
   Single flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.233.2.
   Dual flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A112.19.2 and ASME A112.19.14.
2. Lavatory faucets shall not have a flow rate less than 0.8 gpm at 20 psi.

TABLE 4.303.3
STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

REQUIRED STANDARDS	
Water closets (toilets)—flushometer valve-type single flush, maximum flush volume	ASME A 112.19.2/CSA B45.1 – 1.28 gal (4.8 L)
Water closets (toilets)—flushometer valve-type dual flush, maximum flush volume	ASME A 112.19.14 and U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification – 1.28 gal (4.8 L).
Water closets (toilets)—tank type	U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification
Urinals, maximum flush volume	ASME A 112.19.2/CSA B45.1 – 0.5 gal (1.9 L)
Urinals, nonwater urinals	ASME A 112.19.19 (vitreous china) ANSI Z124.9-2004 or IAPMO Z124.9 (plastic)
Public lavatory faucets: Maximum flow rate – 0.5 gpm (1.9 L/min)	ASME A 112.18.1/CSA B125.1
Public metering self-closing faucets: Maximum water use – 0.25 gal (1.0 L) per metering cycle	ASME A 112.18.1/CSA B125.1
Residential bathroom lavatory sink faucets: Maximum flow rate – 1.5 gpm (5.7 L/min)	ASME A 112.18.1/CSA B125.1

SECTION 4.304
OUTDOOR WATER USE

4.304.1 Irrigation controllers. Automatic irrigation system controllers for landscaping provided by the builder and installed at the time of final inspection shall comply with the following:

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change.
2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

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

SECTION 4.305
WATER REUSE SYSTEMS
(Reserved)

CHAPTER 4

RESIDENTIAL MANDATORY MEASURES

Division 4.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION 4.401
GENERAL

4.401.1 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, adjusting and balancing.

SECTION 4.402
DEFINITIONS

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

SECTION 4.403
FOUNDATION SYSTEMS
(Reserved)

SECTION 4.404
EFFICIENT FRAMING TECHNIQUES
(Reserved)

SECTION 4.405
MATERIAL SOURCES
(Reserved)

SECTION 4.406
ENHANCED DURABILITY AND REDUCED MAINTENANCE

4.406.1 Joints and openings. Openings in the building envelope separating conditioned space from unconditioned space needed to accommodate gas, plumbing, electrical lines and other necessary penetrations must be sealed in compliance with the *California Energy Code*.

Exception: Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or a similar method acceptable to the enforcing agency.

SECTION 4.407
WATER RESISTANCE AND MOISTURE MANAGEMENT
(Reserved)

SECTION 4.408
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

4.408.1 Construction waste reduction of at least 50 percent. Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist or are not located reasonably close to the jobsite.

4.408.2 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, a construction waste management plan shall be submitted for approval to the enforcing agency that:

1. Identifies the materials to be diverted from disposal by recycling, reuse on the project or salvage for future use or sale.
2. Specifies if materials will be sorted on-site or mixed for transportation to a diversion facility.
3. Identifies the diversion facility where the material collected will be taken.
4. Identifies construction methods employed to reduce the amount of waste generated.
5. Specifies that the amount of materials diverted shall be calculated by weight or volume, but not by both.

4.408.2.1 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 4.408.2, Items 1 through 5. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

4.408.2.2 Isolated jobsites. The enforcing agency may make exceptions to the requirements of this section when

jobsites are located in areas beyond the haul boundaries of the diversion facility.

Notes:

1. Sample forms found in Chapter 8 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).

SECTION 4.409
LIFE CYCLE ASSESSMENT
(Reserved)

SECTION 4.410
BUILDING MAINTENANCE AND OPERATION

4.410.1 Operation and maintenance manual. At the time of final inspection, a manual, compact disc, web-based reference or other media acceptable to the enforcing agency which includes all of the following shall be placed in the building:

1. Directions to the owner or occupant that the manual shall remain with the building throughout the life cycle of the structure.
2. Operation and maintenance instructions for the following:
   a. Equipment and appliances, including water-saving devices and systems, HVAC systems, water-heating systems and other major appliances and equipment.
   b. Roof and yard drainage, including gutters and downspouts.
   c. Space conditioning systems, including condensers and air filters.
   d. Landscape irrigation systems.
   e. Water reuse systems.
3. Information from local utility, water and waste recovery providers on methods to further reduce resource consumption, including recycle programs and locations.
4. Public transportation and/or carpool options available in the area.
5. Educational material on the positive impacts of an interior relative humidity between 30–60 percent and what methods an occupant may use to maintain the relative humidity level in that range.
6. Information about water-conserving landscape and irrigation design and controllers which conserve water.
7. Instructions for maintaining gutters and downspouts and the importance of diverting water at least 5 feet away from the foundation.
8. Information on required routine maintenance measures, including, but not limited to, caulking, painting, grading around the building, etc.
9. Information about state solar energy and incentive programs available.
10. A copy of all special inspection verifications required by the enforcing agency or this code.

CHAPTER 4
RESIDENTIAL MANDATORY MEASURES

Division 4.5 – ENVIRONMENTAL QUALITY

SECTION 4.501
GENERAL

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

SECTION 4.502
DEFINITIONS

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

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.

COMPOSITE WOOD PRODUCTS. Composite wood products include hardwood plywood, particleboard and medium density fiberboard. Composite wood products do not include hardboard, structural plywood, structural panels, structural composite lumber, oriented strand board, glued laminated timber as specified in "Structural Glued Laminated Timber" (ANSI A190.1-2002) or prefabricated wood I-joists.

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.

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

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).

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

VOC. A volatile organic compound 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 SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 4.503
FIREPLACES

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

SECTION 4.504
POLLUTANT CONTROL

4.504.1 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation or during storage on the construction site and until final startup of the heating and cooling 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 or debris which may collect in the system.

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

4.504.2.1 Adhesives, sealants and caulks. Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards unless more stringent local or regional air pollution or air quality management district rules apply:

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

toxic compounds, of *California Code of Regulations*, Title 17, commencing with Section 94507.

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

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

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

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

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

1. Carpet and Rug Institute's Green Label Plus Program.
2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
3. NSF/ANSI 140 at the Gold level.
4. Scientific Certifications Systems Indoor Advantage™ Gold.

TABLE 4.504.1
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 adhesives 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.

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

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

TABLE 4.504.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2, 3]
Grams of VOC per Liter of Coating,
Less Water and Less Exempt Compounds

COATING CATEGORY	EFFECTIVE 1/1/2010	EFFECTIVE 1/1/2012
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	400	250
Shellacs Clear Opaque	 730 550	
Specialty primers, sealers and undercoaters	350	100
Stains	250	
Stone consolidants	450	
Swimming pool coatings	340	
Traffic marking coatings	100	
Tub and tile refinish coatings	420	
Waterproofing membranes	250	
Wood coatings	275	
Wood preservatives	350	
Zinc-rich primers	340	

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

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

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

4.504.4 Resilient flooring systems. Where resilient flooring is installed, at least 50 percent of floor area receiving resilient flooring shall comply with the VOC emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.

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

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

1. Product certifications and specifications
2. Chain of custody certifications
3. Other methods acceptable to the enforcing agency

TABLE 4.504.5
FORMALDEHYDE LIMITS[1]
Maximum Formaldehyde Emissions in Parts per Million

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

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333-96(2002). For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of 8 millimeters.

SECTION 4.505
INTERIOR MOISTURE CONTROL

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

4.505.2 Concrete slab foundations. Concrete slab foundations required to have a vapor retarder by *California Building Code*, CCR, Title 24, Part 2, Chapter 19, shall also comply with this section.

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

1. A 4-inch (101.6 mm) thick base of $^1/_2$ inch (12.7 mm) or larger clean aggregate shall be provided with a

vapor barrier in direct contact with concrete and a concrete mix design, which will address bleeding, shrinkage, and curling, shall be used. For additional information, see American Concrete Institute, ACI 302.2R-06.

2. Other equivalent methods approved by the enforcing agency.
3. A slab design specified by a licensed design professional.

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

1. Moisture content shall be determined with either a probe-type or contact-type moisture meter.
2. Moisture readings shall be taken at a point 2 feet (610 mm) to 4 feet (1219 mm) from the grade stamped end of each piece to be verified.
3. At least three random moisture readings shall be performed on wall and floor framing with documentation acceptable to the enforcing agency provided at the time of approval to enclose the wall and floor framing.

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

SECTION 4.506
INDOOR AIR QUALITY AND EXHAUST

4.506.1 Bathroom exhaust fans. Mechanical exhaust fans which exhaust directly from bathrooms shall comply with the following:

1. Fans shall be ENERGY STAR compliant and be ducted to terminate outside the building.
2. Unless functioning as a component of a whole house ventilation system, fans must be controlled by a humidistat which shall be readily accessible.

Humidistat controls shall be capable of adjustment between a relative humidity range of 50 to 80 percent.

Note: For the purposes of this section, a bathroom is a room which contains a bathtub, shower or tub/shower combination.

SECTION 4.507
ENVIRONMENTAL COMFORT

4.507.1 Openings. Whole house exhaust fans shall have insulated louvers or covers which close when the fan is off. Covers or louvers shall have a minimum insulation value of R-4.2.

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

1. The heat loss and heat gain is established according to ACCA Manual J, ASHRAE handbooks or other equivalent design software or methods.
2. Duct systems are sized according to ACCA 29-D Manual D, ASHRAE handbooks or other equivalent design software or methods.
3. Select heating and cooling equipment according to ACCA 36-S Manual S or other equivalent design software or methods.

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

SECTION 4.508
OUTDOOR AIR QUALITY
(Reserved)

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 5 – NONRESIDENTIAL MANDATORY MEASURES
DIVISION 1 – PLANNING AND DESIGN

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
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												
5.106.8							X												
5.106.10							X												

CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES

Division 5.1 – PLANNING AND DESIGN

SECTION 5.101
GENERAL

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

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° above nadir, and 100 (10 percent) at a vertical angle of 80° above nadir. This applies to all lateral angles around the luminaire.

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.

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.

PZEV. Any vehicle certified by the California Air Resources Board as a Partial Credit Zero Emission Vehicle.

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.

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

ZEV. Any vehicle certified to zero-emission standards.

SECTION 5.103
SITE SELECTION
(Reserved)

SECTION 5.104
SITE PRESERVATION
(Reserved)

SECTION 5.105
DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES
(Reserved)

SECTION 5.106
SITE DEVELOPMENT

5.106.1 Storm water pollution prevention plan. For newly constructed projects of less than one acre, develop a Storm Water Pollution Prevention Plan (SWPPP) that has been designed, specific to its site, conforming to the State Storm water NPDES Construction Permit or local ordinance, whichever is stricter, as is required for projects one acre or more. The plan should cover prevention of soil loss by storm water run-off and/or wind erosion, of sedimentation, and/or of dust/particulate matter air pollution.

Note: Assistance with the permit may be obtained from the California State Water Resources Control Board (SWRCB) at: http://www.swrcb.ca.gov/stormwtr/, from a Regional Water Quality Control Board, and at local public works departments.

5.106.4 Bicycle parking and changing rooms. Comply with Sections 5.106.4.1 and 5.106.4.2; or meet local ordinance or the University of California Policy on Sustainable Practices, whichever is stricter.

5.106.4.1 Short-Term bicycle parking. If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 100 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.

5.106.4.2 Long-Term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of motorized vehicle parking capacity, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and may include:

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

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

5.106.5.2 Designated parking. 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
VEHICLE

5.106.8 Light pollution reduction. Comply with lighting power requirements in the *California Energy Code*, CCR, Part 6, and design interior and exterior lighting such that zero direct-beam illumination leaves the building site. Meet or exceed exterior light levels and uniformity ratios for lighting zones 1–4 as defined in Chapter 10 of the *California Administrative Code*, CCR, Part 1, using the following strategies:

1. Shield all exterior luminaires or provide cutoff luminaires per Section 132 (b) of the *California Energy Code.*
2. Contain interior lighting within each source.
3. Allow no more than .01 horizontal lumen footcandles to escape 15 feet beyond the site boundary.
4. Automatically control exterior lighting dusk to dawn to turn off or lower light levels during inactive periods.

Exceptions:

1. Part 2, Chapter 12, Section 1205.6 for campus lighting requirements for parking facilities and walkways.
2. Emergency lighting and lighting required for nighttime security.

5.106.10 Grading and paving. The site shall be planned and developed to keep surface water from entering buildings. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows.

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

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				CSA	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. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.

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

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
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												
5.303.2							X												
Table 5.303.2.2							X												
Table 5.303.2.3							X												
5.303.4, Item 1 only							X												
5.303.6							X												
Table 5.303.6							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 words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

GRAYWATER. Untreated household waste which has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins and water from clothes washing machines and laundry tubs. It shall not include waste water from kitchen sinks, dishwashers or laundry water from soiled diapers.

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

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

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

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 this section, a dedicated meter may be considered a submeter.

WATER BUDGET. Estimated total landscape irrigation water use shall not exceed the maximum applied water allowance calculated in accordance with the Department of Water Resources Model Efficient Landscape Ordinance (MLO).

SECTION 5.303
INDOOR WATER USE

5.303.1 Meters. Separate meters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.

5.303.1.1 Buildings 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.
2. For spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop projected to consume more than 100 gal/day.

5.303.1.2 Excess consumption. Any building within a project or space within a building that is projected to consume more than 1,000 gal/day.

5.303.2 Twenty percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the *California Building Standards Code.* The 20 percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Each plumbing fixture and fitting shall meet the 20 percent reduced flow rate specified in Table 5.303.2.3, or
2. A calculation demonstrating a 20 percent reduction in the building "water use baseline" as established in Table 5.303.2.2 shall be provided.

5.303.2.1 Multiple showerheads serving one shower. When single shower fixtures are served by more than one showerhead, the combined flow rate of all the showerheads shall not exceed the maximum flow rates specified in the 20 percent reduction column contained in Table 5.303.2.3 or the shower shall be designed to only allow one showerhead to be in operation at a time.

Exception: The maximum flow rate for shower heads when using the calculation method specified in Section 5.303.2, Item 2 is 2.5 gpm @ 80 psi.

5.303.4 Wastewater reduction. Each building shall reduce by 20 percent wastewater by one of the following methods:

1. [DSA-SS] The installation of water-conserving fixtures (water closets, urinals) meeting the criteria established in sections 5.303.2 or 5.303.3 or
2. Utilizing nonpotable water systems [captured rainwater, graywater, and municipally treated wastewater (recycled water) complying with the current edition of the California Plumbing Code or other methods described in Section A5.304].

5.303.6 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 5.503.6.

TABLE 5.303.2.2
INDOOR WATER USE BASELINE[4]

FIXTURE TYPE	FLOW RATE[2]	DURATION	DAILY USES	OCCUPANTS[3]
Showerheads	2.5 gpm @ 80 psi	8 min.	1	X
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	X
Replacement aerators	2.2 gpm @ 60 psi			X
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]			X
Metering faucets	0.25 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.25 min.		X
Gravity tank type water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	1.0 gallons/flush	1 flush	2 male	X

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

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20, *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. Refer to Table A, Chapter 4, *California Plumbing Code*, for occupant load factors.
4. Use Worksheet WS-1 to calculate base line water use.

TABLE 5.303.2.3
FIXTURE FLOW RATES

FIXTURE TYPE	FLOW RATE	MAXIMUM FLOW RATE AT 20 percent REDUCTION
Showerheads	2.5 gpm @ 80 psi	2 gpm @ 80 psi
Lavatory faucets—nonresidential	0.5 gpm @ 60 psi	0.4 gpm @ 60 psi
Kitchen faucets	2.2 gpm @ 60 psi	1.8 gpm @ 60 psi
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]	1.8 [rim space (in.)/20 gpm @ 60 psi]
Metering faucets	0.25 gallons/cycle	0.2 gallons/cycle
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.20 [rim space (in.)/20 gpm @ 60 psi]
Gravity tank type water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer tank water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Flushometer valve water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Electromechanical hydraulic water closets	1.6 gallons/flush	1.28 gallons/flush[1]
Urinals	1.0 gallons/flush	.5 gallons/flush

1. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less:
   Single flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A 112.19.233.2.
   Dual flush toilets—The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A 112.19.2 and ASME A 112.19.14.

TABLE 5.303.6
STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS

REQUIRED STANDARDS	
Water closets (toilets) – flushometer valve type single flush, maximum flush volume	ASME A 112.19.2/ CSA B45.1 – 1.28 gal (4.8 L)
Water closets (toilets) – flushometer valve type dual flush, maximum flush volume	ASME A 112.19.14 and USEPA WaterSense Tank-Type High-Efficiency Toilet Specification – 1.28 gal (4.8 L)
Water closets (toilets) – tank-type	U.S. EPA WaterSense Tank-Type High-Efficiency Toilet Specification
Urinals, maximum flush volume	ASME A 112.19.2/ CSA B45.1 – 0.5 gal (1.9 L)
Urinals, nonwater urinals	ASME A 112.19.19 (vitreous china) ANSI Z124.9-2004 or IAPMO Z124.9 (plastic)
Public lavatory faucets: Maximum flow rate – 0.5 gpm (1.9 L/min)	ASME A 112.18.1/CSA B125.1
Public metering self-closing faucets: Maximum water use – 0.25 gal (1.0 L) per metering cycle	ASME A 112.18.1/CSA B125.1
Residential bathroom lavatory sink faucets: Maximum flow rate – 1.5 gpm (5.7 L/min)[1]	ASME A 112.18.1/CSA B125.1

SECTION 5.304
OUTDOOR WATER USE

5.304.1 Water budget. A water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

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

5.304.2 Outdoor potable water use. For new water service for landscaped areas between 1,000 square feet and 5,000 square feet (the level at which *Water Code* §535 applies), separate meters or submeters shall be installed for indoor and outdoor potable water use.

5.304.3 Irrigation design. In new nonresidential construction with between 1,000 and 2,500 square feet of landscaped area (the level at which the MLO applies), install irrigation controllers and sensors which include the following criteria, and meet manufacturer's recommendations.

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

1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in

response to changes in plants' needs as weather conditions change.

2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.

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

SECTION 5.305
WATER REUSE SYSTEMS
(Reserved)

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
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												
5.402.1 ADJUST							X												
5.402.1 BALANCE							X												
5.402.1 TEST							X												
5.407							X												
5.408.1–5.408.3							X												
5.410.1							X												
5.410.1.1							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 words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

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

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

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.

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

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.

Notes:

1. Use features such as overhangs and recesses, and flashings integrated with a drainage plane.
2. Use nonabsorbent floor and wall finishes within at least two feet around and perpendicular to such openings.

SECTION 5.408
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

5.408.1 Construction waste diversion. Establish a construction waste management plan for the diverted materials, or meet local construction and demolition waste management ordinance, whichever is more stringent.

5.408.2 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan for approval by the enforcement agency that:

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

5.408.2.1 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 5.408.2, Items 1 thru 4. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency.

Exception: [DSA-SS] Jobsites in areas where there is no mixed construction and demolition debris (C&D) processor or recycling facilities within a feasible haul distance shall meet the requirements as follows:

1. The enforcement agency having jurisdiction shall at its discretion, enforce the waste management plan and make exceptions as deemed necessary.

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

Notes:

1. Sample forms found in Chapter 8 may be used to assist in documenting compliance with the waste management plan.
2. Mixed construction and demolition debris (C&D) processors can be located at the California Department of Resources Recycling and Recovery (CalRecycle).

5.408.3 Construction waste reduction of at least 50 percent. Recycle and/or salvage for reuse a minimum of 50 percent of the non-hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both.

Exceptions:

1. Excavated soil and land-clearing debris
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

5.408.4 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.

SECTION 5.409
LIFE CYCLE ASSESSMENT
(Reserved)

SECTION 5.410
BUILDING MAINTENANCE AND OPERATION

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

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

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

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

5.410.2.1 Owner's or Owner representative'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. This documentation shall include the following:

1. Environmental and sustainability goals
2. Energy efficiency 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). 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, and updated as necessary during the design and construction phases. The Basis of Design document shall cover the following systems:

1. Heating, ventilation, air conditioning (HVAC) systems and controls
2. Indoor lighting system and controls
3. Water heating system
4. Renewable energy systems
5. Landscape irrigation systems
6. Water reuse systems

5.410.2.3 Commissioning plan. Prior to permit issuance a commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. 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 requirements listed in Sections 5.410.2.4 through 5.410.2.6 shall be included

5.410.2.4 Functional performance testing. 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. 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. Documentation of the operational 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 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 all special inspection verifications required by the enforcing agency or this code
7. Other resources and documentation

5.410.2.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall be 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. A complete report of commissioning process activities undertaken through the design, construction and reporting recommendations for postconstruction phases of the building project shall be completed and provided to the owner or representative.

5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.

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 at a minimum, as applicable to the project:

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

5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with industry best practices and applicable standards on each system as determined by the building official.

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, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; or Associated Air Balance Council National Standards or as approved by the building official.

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
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												
5.504.4.6.1, Item 2							X												
5.504.5.3							X												
5.505							X												
5.506.1							X												
5.508.1							X												
5.508.1.1							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 words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

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.

Note: See CCR, Title 17, Section 93120.1.

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2-1999.

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 O3 /g ROC).

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

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).

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

VOC. A volatile organic compound 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 SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

SECTION 5.503
FIREPLACES

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

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

SECTION 5.504
POLLUTANT CONTROL

5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation, or during storage on the construction site and until final startup of the heating and cooling 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 or debris which may collect in the system.

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

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	250
Porous	775
Modified bituminous	500
Marine deck	760
Other	750

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

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

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.

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	EFFECTIVE 1/1/2010	EFFECTIVE 1/1/2012
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	400	250
Shellacs:		
Clear	730	
Opaque	550	
Specialty primers, sealers and undercoaters	350	100
Stains	250	
Stone consolidants	450	
Swimming pool coatings	340	
Traffic marking coatings	100	
Tub and tile refinish coatings	420	
Waterproofing membranes	250	
Wood coatings	275	
Wood preservatives	350	
Zinc-rich primers	340	

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

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

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

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

1. Carpet and Rug Institute's Green Label Plus Program.
2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350).
3. NSF/ANSI 140 at the Gold level.
4. Scientific Certifications Systems Sustainable Choice.

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 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 for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table 5.504.4.5.

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

PRODUCT	CURRENT LIMIT	JAN 1, 2012	JUL 1, 2012
Hardwood plywood veneer core	0.05		
Hardwood plywood composite core	0.08		0.05
Particle board	0.09		
Medium density fiberboard	0.11		
Thin medium density fiberboard[2]	0.21	0.13	

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333-96 (2002). For additional information, see *California Code of Regulations,* Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of eight millimeters.

5.504.4.5.1 Early compliance. Reserved.

5.504.4.5.2 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. Other methods acceptable to the enforcing agency

5.504.4.6 Resilient flooring systems. For 50 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List (or Product Registry) or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.

[DSA-SS] Documentation shall be provided that verifies that finish materials are certified to meet the pollutant emission limits.

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

Notes:

1. CHPS Low-emitting Materials List may be found at www.chpregistry.com/live or http://www.chps.net/dev/Drupal/node/381.
2. [DSA-SS] Products certified under the FloorScore program may be found at: http://www.rfci.com/ int_FS-ProdCert.htm.
3. Products certified under the Greenguard Children & Schools program and compliant with CHPS criteria may be found at: http://www.greenguard.org/Default.aspx?tabid =135.

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 prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 8.

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 in buildings; 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 121 (Requirements For Ventilation) of the *California Energy Code*, CCR, Title 24, Part 6, or the applicable local code, whichever is more stringent, and Chapter 4 of CCR, Title 8.

5.506.2 Carbon dioxide (CO_2) monitoring. For buildings equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the current edition of the *California Energy Code*, CCR, Title 24, Part 6, Section 121(c).

SECTION 5.507
ENVIRONMENTAL COMFORT

5.507.4 Acoustical control. Employ building assemblies and components with Sound Transmission Coefficient (STC) values determined in accordance with ASTM E 90 and ASTM E 413.

5.507.4.1 Exterior noise transmission. Wall and roof-ceiling assemblies making up the building envelope shall have an STC of at least 50, and exterior windows shall have a minimum STC of 30 for any of the following building locations:

1. Within 1,000 ft (300 m) of right of ways of freeways.
2. Within 5 mi. (8 km) of airports serving more than 10,000 commercial jets per year.
3. Where sound levels at the property line regularly exceed 65 decibels, other than occasional sound due to church bells, train horns, emergency vehicles and public warning systems.

Exception: Buildings with few or no occupants and 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.

5.507.4.2 Interior sound. 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 in the catalog of STC and ICC Ratings for Wall and Floor/Ceiling Assemblies.

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.

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
CHAPTER 6 – REFERENCED ORGANIZATIONS AND STANDARDS

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

CHAPTER 6

REFERENCED ORGANIZATIONS AND STANDARDS

SECTION 601
GENERAL

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

ORGANIZATION	STANDARD	REFERENCED SECTION
AABC Associated Air Balance Council		
1518 K St NW Washington, DC 20005 www.aabc.com	National Standards, 1989	5.410.4.3.1 A5.410.5.3.1
ACCA Air Conditioning Contractors of America		
2800 Shirlington Road, Suite 300 Arlington, VA 22206 www.acca.org	ACCA Manual J ACCA 29-D Manual D ACCA 36-S Manual S	4.507.2 4.507.2 4.507.2
ANSI American National Standards Institute		
Operations Office 25 West 43rd Street, Fourth Floor New York, NY 10036 www.ansi.org	ANSI A190.1-2002 ANSI Z124.9-2004 NSF/ANSI 140-2007	4.502 Table 4.303.3 4.504.3, 5.504.4.4
ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.		
1791 Tullie Circle, NE Atlanta, GA 30329 www.ashrae.org	52.1-92 52.2-99 62.2 90.1	A5.504.1 A4.502 A5.504.1 5.108.8
ASME American Society of Mechanical Engineers		
Three Park Avenue New York, NY 10016-5990 www.asme.org	ASME A112.18.1 ASME A112.19 ASME A112.19.2 ASME A112.19.14 ASME A112.19.19	Table 4.303.3, 5.303.6 5.303.6 Table 4.303.3, 5.303.2 Table 4.303.3, 5.303.6 Table 4.303.3
ASTM ASTM International		
100 Barr Harbor Drive West Conshohocken, PA 19428-2859 www.astm.org	ASTM C 33 ASTM C 1371-98 ASTM E 90 ASTM E 408-71(2002) ASTM E 413 ASTM E 1333-96 (2002) ASTM E 1903-97 ASTM E 1980-01	A 5.405.5.3.2 A4.205.1 5.507.5 A4.205.1 5.507.5 Table 4.504.5 A 5.103.4 A4.106.5.3
CSA Canadian Standards Association		
5060 Spectrum Way, Suite 100 Mississauga, Ontario, Canada L4W 5N6 www.csa.ca	CSA B45.1 CSA B125.1	Table 4.303.1, Table 4.303.3 Table 4.303.3, 5.303.6
IAPMO International Association of Plumbing and Mechanical Officials		
5001 E. Philadelphia St. Ontario, CA 91761 iapmo@iapmo.org	IAPMO Z124.9	Table 4.303.3, 5.303.6
NEBB National Environmental Balancing Bureau		
8575 Grovemont Cir Gaithersburg, MD 20877 http://nebb.org/index.php	Procedural Standards, 1983	5.410.4.3.1 A5.410.5.3.1
NSF International		
789 Dixboro Rd. Ann Arbor, MI 48113-0140 http://www.nsf.org/	NSF/ANSI 140-2007	4.504.3, 5.504.4.4
TABB Testing, Adjusting and Balancing Bureau		
601 N Fairfax St, Ste 250 Alexandria, VA 22314 http://www.tabbcertified.org/contact.html	National Standards, 2003	5.410.3.3.1 A5.410.5.3.1

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

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

CHAPTER 7
INSTALLER AND SPECIAL INSPECTOR QUALIFICATIONS

SECTION 701
GENERAL
(Reserved)

SECTION 702
QUALIFICATIONS

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

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

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

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

Notes:

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

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

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

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

SECTION 703
VERIFICATIONS

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

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

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter	**X**						**X**												
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below			**X**																
Chapter/Section																			
WS 1 – BASELINE WATER USE			X																
WS 2 – 20% REDUCTION WATER USE CALCULATION TABLE			X																
WS 3 – 30, 35 or 40% REDUCTION WATER USE CALCULATION TABLE																			
CWM PLAN – CONSTRUCTION WASTE MANAGEMENT PLAN			X																
CWM WORKSHEET – CONSTRUCTION WASTE MANAGEMENT WORKSHEET			X																
CWM ACKNOWLEDGMENT – CONSTRUCTION WASTE MANAGEMENT ACKNOWLEDGMENT			X																

CHAPTER 8

COMPLIANCE FORMS AND WORKSHEETS

WORKSHEET (WS-1)
BASELINE WATER USE

BASELINE WATER USE CALCULATION TABLE									
FIXTURE TYPE	FLOW RATE (gpm)[2]		DURATION		DAILY USES		OCCUPANTS[3, 4]		GALLONS PER DAY
Showerheads	2.5	×	5 min.	×	1	×		=	
Showerheads residential	2.5	×	8 min.	×	1	×		=	
Lavatory faucets residential	2.2	×	.25 min.	×	3	×		=	
Kitchen faucets	2.2	×	4 min.	×	1	×		=	
Replacement aerators	2.2	×		×		×		=	
Wash fountains	2.2	×		×		×		=	
Metering faucets	0.25	×	.25 min.	×	3	×		=	
Metering faucets for wash fountains	2.2	×	.25 min.	×		×		=	
Gravity tank type water closets	1.6	×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer tank water closets	1.6	×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer valve water closets	1.6	×	1 flush	×	1 male[1] 3 female	×		=	
Electromechanical hydraulic water closets	1.6	×	1 flush	×	1 male[1] 3 female	×		=	
Urinals	1.0	×	1 flush	×	2 male	×		=	
Total daily baseline water use (BWU)								=	
_____ (BWU) × .80 = _____ Allowable water use									

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20 *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3 . For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
4. For nonresidential occupancies, refer to Table A, Chapter 4, 2010 *California Plumbing Code*, for occupant load factors.

WORKSHEET (WS-2)
20 PERCENT REDUCTION WATER USE

20 PERCENT REDUCTION WATER USE CALCULATION TABLE									
FIXTURE TYPE	FLOW RATE (gpm)[2]		DURATION		DAILY USES		OCCUPANTS[3, 4]		GALLONS PER DAY
Showerheads		×	5 min.	×	1	×		=	
Showerheads residential		×	8 min.	×	1	×		=	
Lavatory faucets residential		×	.25 min.	×	3	×		=	
Kitchen faucets		×	4 min.	×	1	×		=	
Replacement aerators		×		×		×		=	
Wash fountains		×		×		×		=	
Metering faucets		×	.25 min.	×	3	×		=	
Metering faucets for wash fountains		×	.25 min.	×		×		=	
Gravity tank type water closets		×	1 flush	×	1 male[1] 3 female	×		=	
HET[5] High-efficiency toilet	1.28	×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer tank water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer valve water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Electromechanical hydraulic water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Urinals		×	1 flush	×	2 male	×		=	
Urinals Nonwater supplied	0.0	×	1 flush	×	2 male	×		=	
Proposed water use								=	
_____ (BWU from WS-1) × .80 = _____ Allowable water use									

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20 *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
4. For nonresidential occupancies, refer to Table A, Chapter 4, 2010 *California Plumbing Code*, for occupant load factors.
5. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.

   Single flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A 112.19.233.2.

   Dual flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A 112.19.2 and ASME A 112.19.14.

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

30, 35 OR 40 PERCENT REDUCTION WATER USE CALCULATION TABLE									
FIXTURE TYPE	FLOW RATE (gpm)[2]		DURATION		DAILY USES		OCCUPANTS[3, 4]		GALLONS PER DAY
Showerheads		×	5 min.	×	1	×		=	
Showerheads residential		×	8 min.	×	1	×		=	
Lavatory faucets residential		×	.25 min.	×	3	×		=	
Kitchen faucets		×	4 min.	×	1	×		=	
Replacement aerators		×		×		×		=	
Wash fountains		×		×		×		=	
Metering faucets		×	.25 min.	×	3	×		=	
Metering faucets for wash fountains		×	.25 min.	×		×		=	
Gravity tank type water closets		×	1 flush	×	1 male[1] 3 female	×		=	
HET[5] High-efficiency toilet	1.12	×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer tank water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Flushometer valve water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Electromechanical hydraulic water closets		×	1 flush	×	1 male[1] 3 female	×		=	
Urinals		×	1 flush	×	2 male	×		=	
Urinals Nonwater supplied	0.0	×	1 flush	×	2 male	×		=	
Proposed water use								=	
30% Reduction_____ (BWU from WS-1) × .70 = _____ Allowable water use 35% Reduction_____ (BWU from WS-1) × .65 = _____ Allowable water use 40% Reduction_____ (BWU from WS-1) × .60 = _____ Allowable water use									

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20 *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. For low-rise residential occupancies, the number of occupants shall be based on two persons for the first bedroom, plus one additional person for each additional bedroom.
4. For nonresidential occupancies, refer to Table A, Chapter 4, 2010 *California Plumbing Code*, for occupant load factors.
5. Includes single and dual flush water closets with an effective flush of 1.28 gallons or less.

   Single flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A 112.19.233.2.

   Dual flush toilets - The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush. Flush volumes will be tested in accordance with ASME A 112.19.2 and ASME A 112.19.14.

Construction Waste Management (CWM) Plan

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

Project Name: _____

Job #: _____

Project Manager:_____

Waste Hauling Company:_____

Contact Name: _____

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

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

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

   Notes:

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

Construction Waste Management (CWM) Worksheet

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

Project Name: _____

Job Number: _____

Project Manager: _____

Waste Hauling Company: _____

Construction Waste Management (CWM) Plan

WASTE MATERIAL TYPE	DIVERSION METHOD:		PROJECTED DIVERSION RATE
	COMMINGLED AND SORTED OFF SITE	SOURCE SEPARATED ON SITE	
Asphalt			
Concrete			
Shotcrete			
Metals			
Wood			
Rigid insulation			
Fiberglass insulation			
Acoustic ceiling tile			
Gypsum drywall			
Carpet/carpet pad			
Plastic pipe			
Plastic buckets			
Plastic			
Hardiplank siding and boards			
Glass			
Cardboard			
Pallets			
Job office trash, paper, glass & plastic bottles, cans, plastic			
Alkaline and rechargeable batteries, toner cartridges, and electronic devices			
Other:			
Other:			
Other:			
Other:			

Construction Waste Management (CWM) Acknowledgment

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

Project Name: _____

Job Number: _____

Project Manager: _____

Waste Hauling Company: _____

CWM Plan Acknowledgment

The Foreman for each new Subcontractor that comes on site is to receive a copy of the Construction Waste Management Plan and complete this Acknowledgment Form.

I have read the Waste Management Plan for the project; I understand the goals of this plan and agree to follow the procedures described in this plan.

DATE	SUBCONTRACTOR COMPANY NAME	FOREMAN NAME	SIGNATURE

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A4 – RESIDENTIAL VOLUNTARY MEASURES

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				CSA	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 A4

RESIDENTIAL VOLUNTARY MEASURES

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

Division A4.1 – PLANNING AND DESIGN

PREFACE

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

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

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

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

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

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

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

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

SECTION A4.101
GENERAL

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

SECTION A4.102
DEFINITIONS

A4.102.1 Scope. Unless otherwise stated, the words and terms used in this division shall, for the purposes of this division, have the meanings shown in this code.

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

Note: See the full text at EPA's web site.

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

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

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

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

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

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.

SECTION A4.103
SITE SELECTION

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

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

SECTION A4.104
SITE PRESERVATION

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

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

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

SECTION A4.105
DECONSTRUCTION AND REUSE OF EXISTING MATERIALS

A4.105.1 General. Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials or products must comply with current building standards requirements or be an accepted alternate method or material.

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

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

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

SECTION A4.106
SITE DEVELOPMENT

A4.106.1 Building orientation. Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south.

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

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

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

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

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

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

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

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

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

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.
2. Limit turf areas to the greatest extent possible.

   Tier 1 not more than 50 percent of the total landscaped area.

   Tier 2 not more than 25 percent of the total landscaped area.
3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.
4. Hydrozoning irrigation techniques are incorporated into the landscape design.

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

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

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

Exceptions:

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

A4.106.5 Cool roof. Roofing materials for Tier 1 and Tier 2 buildings shall comply with this section:

Exception: Install roof constructions that have a thermal mass over the roof membrane with a weight of at least 25 lb/sf.

A4.106.5.1 Solar reflectance. Roofing materials shall have a minimum 3-year aged solar reflectance equal to or greater than the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2.

If CRRC testing for 3-year aged reflectance is not available for any roofing products, the 3-year aged value shall be determined using the Cool Roof Rating Council (CRRC) certified initial value using the equation $R_{aged} = [0.2 + 0.7[\rho_{initial} - 0.2]$, Where $\rho_{initial}$ = the initial Solar Reflectance.

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

A4.106.5.2 Thermal emittance. Roofing materials shall have a CRRC initial or 3-year aged thermal emittance equal to or greater than those specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2.

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

A4.106.5.3 Solar reflectance index alternative. Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A4.106.5(1) for Tier 1 and Table A4.106.5(2) for Tier 2 may be used as an alternative to compliance with the 3-year aged solar reflectance values and thermal emittance.

SRI values used to comply with this section shall be calculated using the Solar Reflective Index (SRI) Calculation Worksheet (SRI-WS) developed by the California Energy Commission or in compliance with ASTM E1980-01 as specified in Title 24, Part 6, Section 118(i)3. Solar reflectance values used in the SRI-WS shall be based on the 3-year aged reflectance value of the roofing product or the equation in Section A4.106.5.1 if the CRRC certified aged solar reflectance are not available. Certified Thermal emittance used in the SRI-WS may be either the initial value or the three year aged value listed by the CRRC.

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

Note: The Solar Reflective Index Calculation Worksheet (SRI-WS) is available by contacting the Energy Standard Hotline at 1-800-772-3300 or by email at Title24@energy.state.ca.us.

TABLE A4.106.5(1)
TIER 1

ROOF SLOPE	ROOF WEIGHT	CLIMATE ZONE	Minimum 3-year Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2 : 12	N/A	13 & 15	0.55	0.75	64
> 2 : 12	< 5 lb/ft^2	10-15	0.20	0.75	16
	≥ 5 lb/ft^2	1-16	0.15	0.75	10

TABLE A4.106.5(2)
TIER 2

ROOF SLOPE	ROOF WEIGHT	CLIMATE ZONE	Minimum 3-year Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2 : 12	N/A	2,4,6–15	0.65	0.85	78
> 2 : 12	N/A	2,4,6–15	0.23	0.85	20

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

SECTION A4.107
INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS

A4.107.1 Innovative concepts and local environmental conditions. The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.2 – ENERGY EFFICIENCY

SECTION A4.201
GENERAL

A4.201.1 Scope. For the purposes of energy efficiency standards in this appendix, the California Energy Commission will continue to adopt mandatory standards. It is the intent of this code to encourage buildings to achieve exemplary performance in the area of energy efficiency. Specifically, a green building should achieve at least a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards.

SECTION A4.202
DEFINITIONS
(Reserved)

SECTION A4.203
PERFORMANCE APPROACH

A4.203.1 Energy performance. Using an Alternative Calculation Method (ACM) approved by the California Energy Commission, calculate each building's energy and CO_2 emissions, and compare it to the standard or "budget" building to achieve the following:

Tier 1. Exceed the *California Energy Code* based on the 2008 energy standards requirements by 15 percent.

Tier 2. Exceed the *California Energy Code* based on the 2008 energy standards requirements by 30 percent.

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

SECTION A4.204
PRESCRIPTIVE APPROACH
(Reserved)

SECTION A4.205
BUILDING ENVELOPE

A4.205.1 Radiant roof barriers. Radiant roof barrier is installed in Climate Zones 2, 4 and 8 through 15. The radiant barrier must be tested according to ASTM C-1371-98 or ASTM E 408-71(2002) and must be certified by the Department of Consumer Affairs. Radiant barriers must also meet installation criteria specified in Section 4.2.1 of the *California Energy Commission Residential ACM Manual*.

A4.205.2 Window shading. Exterior shading at least 18 inches in depth is provided on south and west windows by at least one of the following methods:

1. Moveable exterior awnings or louvers
2. Porch or patio covers
3. Overhangs

SECTION A4.206
AIR SEALING PACKAGE

A4.206.1 Reduced infiltration. Infiltration is reduced and verified by third party testing to comply with requirements contained in the *California Energy Code*.

SECTION A4.207
HVAC DESIGN, EQUIPMENT AND INSTALLATION

A4.207.1 Innovative systems. Radiant, hydronic, ground source and other innovative space heating and cooling systems included in the proposed design shall be designed using generally accepted industry-approved guidelines and design criteria.

A4.207.2 Commissioning. A commissioning plan shall be developed to document specified building components meet the project design and performance goals.

A4.207.2.1 Commissioning of HVAC Systems. In addition to other items in the commissioning plan the following items, as appropriate, pertaining to the heating, ventilating and cooling systems shall be inspected and certified by an independent third party that is trained or certified to inspect and test building systems as specified in Section 702.2.

1. Verify compliance with the manufacturer's recommended start-up procedures.
2. Verify refrigerant charge by super-heat or other methods specified by the manufacturer.
3. Burner is set to fire at the nameplate input rating.
4. Temperature drop across the evaporator is within the manufacturer's recommended range.
5. Test and verify air flow to be within 10 percent of the initial design air flow.
6. Static pressure within the duct system is within the manufacturer's acceptable range.
7. Verify that the whole house and exhaust ventilation systems meet Title 24 requirements.
8. Verify that the recommended maintenance procedures and schedules are documented and provided to the home owner.

A4.207.2.3 Commissioning checklist. Results of the commissioning inspection shall be included in the *Operation and Maintenance Manual* required in Section 4.410.1.

A4.207.4 Gas-fired heating equipment. Install gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of .90 or higher.

A4.207.5 Heat pumps. If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.

A4.207.6 Cooling equipment. When climatic conditions necessitate the installation of cooling equipment, select cooling equipment with a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0 and an Energy Efficiency Ratio (EER) of at least 11.5.

A4.207.7 Ducts location. Install ductwork to comply with at least one of the following:

1. Install ducts within the conditioned envelope of the building.
2. Install ducts in an underfloor crawl space.
3. Use ducts with an R-6 insulation value or higher.
4. Install ductwork which is buried in the ceiling insulation.

A4.207.8 Duct leakage. Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow.

A4.207.9 Whole house fans. In Climate Zones 2, 4 and 8 through 15, install a whole-house fan with insulated louvers or an insulated cover.

A4.207.10 Ceiling fans. ENERGY STAR ceiling fans are installed in all bedrooms and living areas.

SECTION A4.208
WATER HEATING DESIGN, EQUIPMENT AND INSTALLATION

A4.208.1 Tank type water heater efficiency. The Energy Factor (EF) for a gas-fired storage water heater is higher than .60.

A4.208.2 Tankless water heater efficiency. The Energy Factor (EF) for a gas-fired tankless water heater is .80 or higher.

A4.208.3 Distribution systems. Where the hot water source is more than 10 feet from a fixture, the potable water distribution system shall convey hot water using one of the following methods:

1. A central manifold plumbing system with parallel piping configuration ("home-run system") is installed using the smallest diameter piping allowed by the *California Plumbing Code* or an approved alternate.
2. The plumbing system design incorporates the use of a demand controlled circulation pump.
3. A gravity-based hot water recirculation system is used.
4. A timer-based hot water recirculation system is used.
5. Other methods approved by the enforcing agency.

SECTION A4.209
LIGHTING

A4.209.1 Lighting. Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures.

SECTION A4.210
APPLIANCES

A4.210.1 Appliance rating. Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.

SECTION A4.211
RENEWABLE ENERGY

A4.211.1 New solar homes partnership. Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP).[1,2] Install energy efficiency measures meeting either Tier I or Tier II below.

Tier I. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards by 15 percent.

Tier II. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards by 30 percent.

Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II.

1. In addition, for either Tier I or II, each appliance provided by the builder must be ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.
2. Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website.

A4.211.2 Solar water heating system. A Solar Rating and Certification Corporation (SRCC) OG 300 solar water heating system is installed. The SRCC Solar Energy Factor (SE) shall be used to determine the Solar Fraction (SF). The SF shall be at least 0.5.

A4.211.3 Space for future solar installation. A minimum of 300 square feet of unobstructed roof area facing within 30° of south is provided for future solar collector or photovoltaic panels. Rough-in penetrations through the roof surface within 24 inches (610 mm) of the boundary of the unobstructed roof area are provided for electrical conduit and water piping.

A4.211.4 Future access for solar system. A minimum one-inch (25.4 mm) electrical conduit is provided from the electrical service equipment to an accessible location in the attic or other location approved by the enforcing agency.

SECTION A4.212
ELEVATORS, ESCALATORS AND OTHER EQUIPMENT
(Reserved)

SECTION A4.213
INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS

A4.213.1 Innovative concepts and local environmental conditions. The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.3 – WATER EFFICIENCY AND CONSERVATION

SECTION A4.301
GENERAL
(Reserved)

SECTION A4.302
DEFINITIONS

LANDSCAPE (PLANT) COEFFICIENT (*Kl*). The product of the species factor multiplied by the density factor and the microclimate factor. ($Kl = Ks \times Kd \times Kmc$) The landscape coefficient is used in the landscape water budget calculation. (UCCE, 2000)

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

SECTION A4.303
INDOOR WATER USE

A4.303.1 Kitchen faucets and dishwashers. Kitchen faucets and dishwashers in Tier 1 and Tier 2 buildings shall comply with this section.

Tier 1. The maximum flow rate at a kitchen sink faucet shall not be greater than 1.5 gallons per minute at 60 psi.

Note: Rated flow rates for the default function of the faucet shall be used to demonstrate compliance with this section.

Tier 2. In addition to the kitchen faucet requirements for Tier 1, dishwashers in Tier 2 buildings shall be ENERGY STAR qualified and not use more than 5.8 gallons of water per cycle.

A4.303.2 Nonwater supplied urinals and waterless toilets. Nonwater supplied urinals or composting toilets are installed.

SECTION A4.304
OUTDOOR WATER USE

A4.304.1 Low-water consumption irrigation system. Install a low-water consumption irrigation system which minimizes the use of spray type heads. Spray type irrigation may only be used at turf areas. The remaining irrigation systems shall use only the following types of low-volume irrigation systems:

1. Drip irrigation
2. Bubblers
3. Drip emitters
4. Soaker hose
5. Stream-rotator spray heads
6. Other systems acceptable to the enforcing agency

A4.304.2 Rainwater systems. A rainwater capture, storage and re-use system is designed and installed to use rainwater generated by at least 65 percent of the available roof area.

A4.304.3 Water budget. When landscaping is provided by the builder, a water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

A4.304.4 Potable water reduction. When landscaping is provided by the builder, a water efficient landscape irrigation system shall be installed that reduces potable water use. The potable water use reduction shall be calculated beyond the initial requirements for plant installation and establishment. Calculations for the reduction shall be based on the water budget developed pursuant to Section A4.3.4.3.

Tier 1. Reduce the use of potable water to a quantity that does not exceed 65 percent of *ETo* times the landscape area.

Tier 2. Reduce the use of potable water to a quantity that does not exceed 60 percent of *ETo* times the landscape area.

Note: Methods used to comply with this section must be designed to the meet the requirements of the other parts of the *California Building Standards Code* and may include, but are not limited to, the following:

1. Plant coefficient
2. Irrigation efficiency and distribution uniformity
3. Use of captured rainwater
4. Use of recycled water
5. Water treated for irrigation purposes and conveyed by a water district or public entity
6. Use of graywater

A4.304.4.1 Verification. A calculation demonstrating the applicable potable water use reduction required by this section shall be provided.

A4.304.5 Potable water elimination. When landscaping is provided by the builder 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. Methods used to accomplish the requirements of this section must be designed to the requirements of the *California Building Standards Code* and shall include, but not be limited to, the following:

1. Plant coefficient
2. Irrigation efficiency and distribution uniformity

3. Use of captured rainwater
4. Use of recycled water
5. Water treated for irrigation purposes and conveyed by a water district or public entity
6. Use of graywater

SECTION A4.305
WATER REUSE SYTEMS

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 Chapter 16A of 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.

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.

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION A4.401
GENERAL
(Reserved)

SECTION A4.402
DEFINITIONS
(Reserved)

SECTION A4.403
FOUNDATION SYSTEMS

A4.403.1 Frost protected foundation systems. As allowed by local conditions, utilize a Frost-Protected Shallow Foundation (FPSF) in compliance with the *California Residential Code* (CRC). When an FPSF foundation system is installed, the manual required by Section 4.410.1 shall include instructions to the owner or occupant regarding the necessity for heating the structure as required in Section R403.3 of the *California Residential Code.*

A4.403.2 Reduction in cement use. As allowed by the enforcing agency, cement used in foundation mix design shall be reduced as follows:

Tier 1. Not less than a 20 percent reduction in cement use.

Tier 2. Not less than a 25 percent reduction in cement use.

Note: Products commonly used to replace cement in concrete mix designs include, but are not limited to:

1. Fly ash
2. Slag
3. Silica fume
4. Rice hull ash

SECTION A4.404
EFFICIENT FRAMING TECHNIQUES

A4.404.1 Lumber size. Beams and headers and trimmers are sized and installed as specified in CRC Tables R502.5(1) and R502.5(2). Other calculations acceptable to the enforcing agency which use the minimum size member for the tributary load shall be acceptable.

A4.404.2 Building dimensions and layouts are designed to minimize waste by one or more of the following measures in at least 80 percent of the structure:

1. Building design dimensions in 2-foot increments are used.
2. Windows and doors are located at regular 16″ or 24″ stud positions.
3. Other methods acceptable to the enforcing agency.

A4.404.3 Building systems. Use premanufactured building systems to eliminate solid sawn lumber whenever possible. One or more of the following premanufactured building systems is used:

1. Composite floor joist or premanufactured floor truss framing
2. Composite roof rafters or premanufactured roof truss framing
3. Panelized (SIPS, ICF or similar) wall framing system
4. Other methods approved by the enforcing agency

A4.404.4 Pre-cut materials and details. Material lists are included in the plans which specify the material quantity and provide direction for on-site cuts to be made from the material provided. Material lists and direction shall be provided for the following systems:

1. Floor framing
2. Wall framing
3. Ceiling and roof framing
4. Structural panels and roof sheathing

SECTION A4.405
MATERIAL SOURCES

A4.405.1 Prefinished building materials. Utilize prefinished building materials which do not require additional painting or staining when possible. One or more of the following building materials that do not require additional resources for finishing are used:

1. Exterior trim not requiring paint or stain
2. Windows not requiring paint or stain
3. Siding or exterior wall coverings which do not require paint or stain

A4.405.2 Concrete floors. Floors that do not require additional coverings are used including but not limited to stained, natural or stamped concrete floors.

A4.405.3 Recycled content. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

Tier 1. Not less than a 10 percent recycled content value.

Tier 2. Not less than a 15 percent recycled content value.

Note: Sources and recycled content of some recycled materials can be obtained from CalRecycle.

A4.405.3.1 Determination of recycled content value (RCV). The following equation shall be used to calculate

recycled content value. RCV = (percent PC × material cost) + 0.5 (percent PI × material cost)

Notes:

1. PC means post consumer waste
2. PI means post industrial waste

A4.405.4 Use of building materials from renewable sources. One or more of the following materials manufactured from rapidly renewable sources or agricultural by-products is used:

1. Insulation
2. Bamboo or cork
3. Engineered wood products
4. Agricultural based products
5. Solid wood products
6. Other products acceptable to the enforcing agency

Note: The intent of this section is to utilize building materials and products which are typically harvested within a 10-year or shorter cycle.

SECTION A4.406
ENHANCED DURABILITY AND REDUCED MAINTENANCE
(Reserved)

SECTION A4.407
WATER RESISTANCE AND MOISTURE MANAGEMENT

A4.407.1 Drainage around foundations. Install foundation and landscape drains which discharge to a dry well, sump, bioswale or other approved on-site location.

A4.407.2 Roof drainage. Install gutter and downspout systems to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, rainwater capture system or other approved on-site location.

A4.407.3 Flashing details. Provide flashing details on the building plans which comply with accepted industry standards or manufacturer's instructions. Details are shown on house plans at all of the following locations:

1. Around windows and doors
2. Roof valleys
3. Deck connections to the structure
4. Roof-to-wall intersections
5. Chimneys to roof intersections
6. Drip caps above windows and doors with architectural projections

Note: Reference details may be found in the *Residential Sheet Metal Guidelines* published by the Sheet Metal and Air Conditioning Contractors' National Association Inc.

A4.407.4 Material protection. Protect building materials delivered to the construction site from rain and other sources of moisture.

A4.407.5 Ice and water barriers. In Climate Zone 16, an ice and water barrier is installed at valley, eaves and wall to roof intersections. The ice and water barrier shall extend at least 24″ inside the exterior wall line or as specified by the manufacturer's installation instructions.

A4.407.6 Door protection. Exterior doors to the dwelling are covered to prevent water intrusion by one or more of the following:

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

A4.407.7 Roof overhangs. A permanent overhang or awning at least 2 feet in depth is provided at all exterior walls.

SECTION A4.408
CONSTRUCTION WASTE DISPOSAL REDUCTION, DISPOSAL AND RECYCLING

A4.408.1 Enhanced construction waste reduction. Nonhazardous construction and demolition debris generated at the site is diverted to recycle or salvage in compliance with one of the following:

Tier 1. At least a 65 percent reduction

Tier 2. At least a 75 percent reduction

Exceptions:

1. Equivalent or alternative waste reduction methods are developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.
2. The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.

A4.408.1.1 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with this section. Documentation shall be in compliance with Section 4.408.2.

SECTION A4.409
LIFE CYCLE ASSESSMENT
(Reserved)

SECTION A4.410
BUILDING MAINTENANCE AND OPERATION
(Reserved)

SECTION A4.411
INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS

A4.411.1 Innovative concepts and local environmental conditions. The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1.

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.5 – ENVIRONMENTAL QUALITY

SECTION A4.501
GENERAL
(Reserved)

SECTION A4.502
DEFINITIONS

MERV. Filter minimum efficiency reporting value, based on ASHRAE 52.2-1999.

NO ADDED FORMALDEHYDE RESIN (NAF). Resin formulated with no added formaldehyde as part of the cross linking structure for making hardwood plywood, particle board or medium density fiberboard. No added formaldehyde resins include, but are not limited to, resins made from soy, polyvinyl acetate or methylene diisocyanate.

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*.

SECTION A4.503
FIREPLACES
(Reserved)

SECTION A4.504
POLLUTANT CONTROL

A4.504.1 Early compliance with formaldehyde limits. Meet the formaldehyde limits contained in Table 4.504.5 before the mandatory compliance date, or use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.

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

A4.504.2 Resilient flooring systems. Resilient flooring systems installed in the building shall meet the percentages specified in this section and comply with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.

Tier 1. At least 80 percent of the total area of resilient flooring installed shall comply.

Tier 2. At least 90 percent of the total area of resilient flooring installed shall comply.

Notes:

1. Information regarding CHPS Low-emitting Materials List may be found at www.chspregistry.com/live or http://www.chps.net/dev/ Drupal/node/381.
2. Information regarding RFCI certified products may be found at http://www.rfci.com/int_FS-ProdCert.htm.
3. Documentation must be provided that verifies that finish materials are certified to meet the pollutant emission limits in this section.

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

Tier 1. Install thermal insulation in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List.

Tier 2. Install insulation which contains No-Added Formaldehyde (NAF) and is in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List.

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

SECTION A4.505
INTERIOR MOISTURE CONTROL
(Reserved)

SECTION A4.506
INDOOR AIR QUALITY AND EXHAUST

A4.506.1 Filters. Filters with a higher value than MERV 6 are installed on central air or ventilation systems. Pressure drop across the filter shall not exceed .1 inches water column.

A4.506.2 Direct-vent appliances. Direct-vent heating and cooling equipment is utilized if the equipment will be located in the conditioned space or install the space heating and water heating equipment in an isolated mechanical room.

SECTION A4.507
ENVIRONMENTAL COMFORT
(Reserved)

SECTION A4.508
OUTDOOR AIR QUALITY
(Reserved)

SECTION A4.509
INNOVATIVE CONCEPTS AND LOCAL ENVIRONMENTAL CONDITIONS

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

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

Division A4.6 – TIER I AND TIER 2

SECTION A4.601
GENERAL

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

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

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

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

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

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

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

1. From Division A4.1, Planning and Design.
   - 1.1. Comply with the topsoil protection requirements in Section A4.106.2.3.
   - 1.2. Comply with the 20 percent permeable paving requirements in Section A4.106.4.
   - 1.3. Comply with the cool roof requirements in Section A4.106.5.
   - 1.4. Comply with at least two elective measures selected from Division A4.1.
2. From Division A4.2, Energy Efficiency.
   - 2.1. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards by 15 percent.
   - 2.2. Comply with at least four elective measures selected from Division A4.2.
3. From Division A4.3, Water Efficiency and Conservation.
   - 3.1. Comply with the reduced flow rate for kitchen sink faucets in Section A4.303.1
   - 3.2. Comply with the Tier 1 potable water use reduction for landscape irrigation design in Section A4.304.4.
   - 3.3. Comply with at least one elective measure selected from Division A4.3.
4. From Division A4.4, Material Conservation and Resource Efficiency.
   - 4.1. Comply with the 20 percent cement reduction requirements in Section A4.403.2.
   - 4.2. Comply with the 10 percent recycled content requirements in Section A4.405.3.
   - 4.3. Comply with the 65 percent reduction in construction waste in Section A4.408.1.
   - 4.4. Comply with at least two elective measures selected from Division A4.4.
5. From Division A4.5, Environmental Quality.
   - 5.1. Comply with the 80 percent resilient flooring systems requirements in Section A4.504.2.
   - 5.2. Comply with the thermal insulation requirements for Tier 1 in Section A4.504.3.
   - 5.3. Comply with at least one elective measure selected from Division A4.5.

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

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

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

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

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

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

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

    1.1 Comply with the topsoil protection requirements for Tier 1 and Tier 2 in Section A4.106.2.3.

    1.2 Comply with the 30 percent permeable paving requirements in Section A4.106.4.

    1.3 Comply with the cool roof requirements in Section A4.106.5.

    1.4 Comply with at least four elective measures selected from Division A4.1.

2. From Division A4.2, Energy Efficiency.

    2.1 Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards by 30 percent.

    2.2 Comply with at least six elective measures selected from Division A4.2.

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

    3.1 Comply with the Tier 1 reduced flow rate for kitchen sink faucets in Section A4.303.1.

    3.2 Comply with the Tier 2 dishwasher requirements in Section A4.303.1.

    3.3 Comply with the Tier 2 potable water use reduction for landscape irrigation design in Section A4.304.4.

    3.4 Comply with at least two elective measures selected from Division A4.3.

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

    4.1 Comply with the 25 percent cement reduction requirements in Section A4.403.2.

    4.2 Comply with the 15 percent recycled content requirements in Section A4.405.3.

    4.3 Comply with the 75 percent reduction in construction waste in Section A4.408.1.

    4.4 Comply with at least four elective measures selected from Division A4.4.

5. From Division A4.5, Environmental Quality.

    5.1 Comply with the 90 percent resilient flooring systems requirements in Section A4.504.2.

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

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

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

APPENDIX A4

RESIDENTIAL VOLUNTARY MEASURES

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.		☐	☐	☐	☐	☐
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 The site shall be planned and developed to keep surface water away from buildings. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows.	☒					
A4.106.1 Orient buildings to optimize the use of solar energy with the long side of the house oriented within 30° of south.		☐	☐	☐	☐	☐
A4.106.2.1 Soil analysis is performed by a licensed design professional and the findings utilized in the structural design of the building.		☐	☐	☐	☐	☐

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
A4.106.2.2 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. Limit turf areas to the greatest extent possible.						
a. Not more than 50 percent for Tier 1.		☐		☐	☐	☐
b. Not more than 25 percent for Tier 2.			☐	☐	☐	☐
3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region.		☐	☐	☐	☐	☐
4. Hydrozoning irrigation techniques are incorporated into the landscape design.		☐	☐	☐	☐	☐
A4.106.4 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 Reflectance Index (SRI) equal to or greater than the values specified in Tables A4.106.5(1) and A4.106.5(2).						
Tier 1 roof covering shall meet or exceed the values contained in Table A4.106.5(1).		☒[2]				
Tier 2 roof covering shall meet or exceed the values contained in Table A4.106.5(2).			☒[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
Innovative Concepts and Local Environmental Conditions						
A4.107.1 Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	☐	☐	☐	☐	☐	☐
Item 2	☐	☐	☐	☐	☐	☐
Item 3	☐	☐	☐	☐	☐	☐
Energy Efficiency						
General						
4.201.1 Low-rise residential buildings shall meet or exceed the minimum standard design required by the California Energy Standards.	☒					
Performance Approach						
A4.203.1 Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards requirements by 15 percent.		☒[2]				
A4.203.1 Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards requirements by 30 percent.			☒[2]			
Prescriptive Approach						
Building Envelope						
A4.205.1 Radiant roof barrier is installed in Climate Zones 2, 4, and 8 through 15.		☐	☐	☐	☐	☐
A4.205.2 Exterior shading at least 18 inches in depth is provided on south and west windows.		☐	☐	☐	☐	☐
Air Sealing Package						
A4.206.1 Third party blower door test is conducted and passed to verify building envelope tightness.		☐	☐	☐	☐	☒

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
HVAC Design, Equipment and Installation						
A4.207.1 Radiant, hydronic, ground source and other innovative space heating and cooling systems included in the proposed design shall be designed using generally accepted industry-approved guidelines and design criteria.		☐	☐	☐	☐	☐
A4.207.2 An HVAC system commissioning plan is developed and the following items, as appropriate, pertaining to the heating and cooling systems are inspected and certified by an independent third party agency: 1. Verify compliance with the manufacturer's recommended start-up procedures. 2. Verify refrigerant charge by super-heat or other methods specified by the manufacturer. 3. Burner is set to fire at the nameplate input rating. 4. Temperature drop across the evaporator is within the manufacturer's recommended range. 5. Test and verify air flow to be within 10 percent of the initial design air flow. 6. Static pressure within the duct system is within the manufacturer's acceptable range. 7. Verify that the whole house and exhaust ventilation systems meet Title 24 requirements. 8. Verify that the recommended maintenance procedures and schedules are documented and provided to the home owner.		☐	☐	☐	☐	☒
A4.207.2.3 Results of the commissioning inspection shall be included in the Operation and Maintenance Manual required in Section 4.410.1.		☐	☐	☐	☐	☐
A4.207.4 Install gas-fired (natural or propane) space heating equipment with an Annual Fuel Utilization Ratio (AFUE) of .90 or higher.		☐	☐	☐	☐	☐
A4.207.5 If an electric heat pump must be used, select equipment with a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher.		☐	☐	☐	☐	☐
A4.207.6 When climatic conditions necessitate the installation of cooling equipment, select cooling equipment with a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0 and an Energy Efficiency Ratio (EER) of at least 11.5.		☐	☐	☐	☐	☐
A4.207.7 Install ductwork to comply with at least one of the following:						
1. Install ducts within the conditioned envelope of the building.		☐	☐	☐	☐	☐
2. Install ducts in an underfloor crawl space.		☐	☐	☐	☐	☐
3. Use ducts with an R-6 insulation value or higher.		☐	☐	☐	☐	☐
4. Install ductwork which is buried in the ceiling insulation.		☐	☐	☐	☐	☐
A4.207.8 Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow.		☐	☐	☐	☐	☐

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
A4.207.9 In cooling Climate Zones 2, 4, and 8 through 15 install a whole-house fan with insulated louvers or an insulated cover.		☐	☐	☐	☐	☐
A4.207.10 ENERGY STAR ceiling fans are installed in all bedrooms and living areas.		☐	☐	☐	☐	☐
Water Heating Design, Equipment and Installation						
A4.208.1 The Energy Factor (EF) for a gas-fired storage water heater is higher than .60.		☐	☐	☐	☐	☐
A4.208.2 The Energy Factor (EF) for a gas-fired tankless water heater is .80 or higher.		☐	☐	☐	☐	☐
A4.208.3 Where the hot water source is more than 10 feet from a fixture, the potable water distribution system shall convey hot water using a method designed to minimize wait time for hot water to arrive at the fixture.		☐	☐	☐	☐	☐
Lighting						
A4.209.1 Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures.		☐	☐	☐	☐	☐
Appliances						
A4.210.1 Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance.		☐	☐	☐	☐	☐
Renewable Energy						
A4.211.1 Install a solar photovoltaic (PV) system in compliance with the California Energy Commission New Solar Homes Partnership (NSHP).[1, 2] Install energy efficiency measures meeting either Tier I or Tier II below. Tier 1. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards requirements by 15 percent. Tier 2. Exceed the *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards requirements by 30 percent. Solar water heating may be used to assist in meeting the energy efficiency requirements of either Tier I or Tier II. 1. In addition, for either Tier I or II, each appliance provided by the builder must be ENERGY STAR if an ENERGY STAR designation is applicable for that appliance. 2. Information on NSHP incentives available through the California Energy Commission may be obtained at the "Go Solar California" website: www.GoSolarCalifornia.ca.gov/nshp/index.html.		☐	☐			☒ ☒
A4.211.2 A solar water heating system is installed.		☐	☐	☐	☐	☐
A4.211.3 Space on the roof surface and penetrations through the roof surface are provided for future solar installation.		☐	☐	☐	☐	☐
A4.211.4 A minimum one-inch conduit is provided from the electrical service equipment for the future installation of a photovoltaic (PV) system.		☐	☐	☐	☐	☐

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
Elevators, Escalators and Other Equipment						
Innovative Concepts and Local Environmental Conditions						
A4.213.1 Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	☐	☐	☐	☐	☐	☐
Item 2	☐	☐	☐	☐	☐	☐
Item 3	☐	☐	☐	☐	☐	☐
WATER EFFICIENCY AND CONSERVATION						
Indoor Water Use						
4.303.1 Indoor water use shall be reduced by at least 20 percent using one of the following methods. 1. Water saving fixtures or flow restrictors shall be used. 2. A 20 percent reduction in baseline water use shall be demonstrated.	☒ 7/01/2011			☐	☐	☐
4.303.2 When using the calculation method specified in Section 4.303.1, multiple showerheads shall not exceed maximum flow rates.	☒ 7/01/2011			☐	☐	☐
4.303.3 Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with specified performance requirements.	☒ 7/01/2011			☐	☐	☐
A4.303.1 Kitchen faucets and dishwashers shall comply with this section. Tier 1. The maximum flow rate at a kitchen sink faucet shall not be greater than 1.5 gallons per minute at 60 psi. Tier 2. In addition to the kitchen faucet requirements for Tier 1, dishwashers in Tier 2 buildings shall be ENERGY STAR qualified and not use more than 5.8 gallons of water per cycle.		☒[2]	☒[2] ☒[2]	☐	☐	☐
A4.303.2 Nonwater supplied urinals or waterless toilets are installed.		☐	☐	☐	☐	☐
Outdoor Water Use						
4.304.1 Automatic irrigation systems controllers installed at the time of final inspection shall be weather-based.	☒			☐	☐	☐
A4.304.1 Install a low-water consumption irrigation system which minimizes the use of spray type heads.		☐	☐	☐	☐	☐
A4.304.2 A rainwater capture, storage and re-use system is designed and installed.		☐	☐	☐	☐	☐
A4.304.3 A water budget shall be developed for landscape irrigation.		☐	☐	☐	☐	☐

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
A4.304.4 Provide water efficient landscape irrigation design that reduces the use of potable water. Tier 1. Does not exceed 65 percent of *ETo* times the landscape area. Tier 2. Does not exceed 60 percent of *ETo* times the landscape area.		☒[2]	☒[2]	☐	☐	☐
A4.304.5 A landscape design is installed which does not utilize potable water.		☐	☐	☐	☐	☐
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

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
Material Sources						
A4.405.1 One or more of the following building materials, that do not require additional resources for finishing are used: 1. Exterior trim not requiring paint or stain 2. Windows not requiring paint or stain 3. Siding or exterior wall coverings which do not require paint or stain		☐	☐	☐	☐	☐
A4.405.2 Floors that do not require additional coverings are used including but not limited to stained, natural or stamped concrete floors.		☐	☐	☐	☐	☐
A4.405.3 Postconsumer or preconsumer recycled content value (RCV) materials are used on the project. Tier 1. Not less than a 10 percent recycled content value. Tier 2. Not less than a 15 percent recycled content value.		☒[2]	☒[2]	☐	☐	☐
A4.405.4 Renewable source building products are used.		☐	☐	☐	☐	☐
Enhanced Durability and Reduced Maintenance						
4.406.1 Joints and openings. Annular spaces around pipes, electric cables, conduits or other openings in plates at exterior walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry or similar method acceptable to the enforcing agency.	☒			☐	☐	☐
Water Resistance and Moisture Management						
A4.407.1 Install foundation and landscape drains.		☐	☐	☐	☐	☐
A4.407.2 Install gutter and downspout systems to route water at least 5 feet away from the foundation or connect to landscape drains which discharge to a dry well, sump, bioswale, rainwater capture system or other approved on-site location.		☐	☐	☐	☐	☐
A4.407.3 Provide flashing details on the building plans and comply with accepted industry standards or manufacturer's instructions.		☐	☐	☐	☐	☐
A4.407.4 Protect building materials delivered to the construction site from rain and other sources of moisture.		☐	☐	☐	☐	☐
A4.407.5 In Climate Zone 16 an ice/water barrier is installed at roof valleys, eaves and wall to roof intersections.		☐	☐	☐	☐	☐
A4.407.6 Exterior doors to the dwelling are protected to prevent water intrusion.		☐	☐	☐	☐	☐
A4.407.7 A permanent overhang or awning at least 2 feet in depth is provided.		☐	☐	☐	☐	☐

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
Construction Waste Reduction, Disposal and Recycling						
4.408.1 A minimum of 50 percent of the construction waste generated at the site is diverted to recycle or salvage.	☒			☐	☐	☐
4.408.2 Where a local jurisdiction does not have a construction and demolition waste management ordinance, a construction waste management plan shall be submitted for approval to the enforcing agency.	☒			☐	☐	☐
A4.408.1 Construction waste generated at the site is diverted to recycle or salvage in compliance with one of the following: 1. Tier 1 at least a 65 percent reduction 2. Tier 2 at least a 75 percent reduction **Exception:** Equivalent waste reduction methods are developed by working with local agencies.		☒[2]	☒[2]	☐ ☐	☐ ☐	☐ ☐
Building Maintenance and Operation						
4.410.1 An operation and maintenance manual shall be provided to the building occupant or owner.	☒			☐	☐	☐
Innovative Concepts and Local Environmental Conditions						
A4.411.1 Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1	☐	☐	☐	☐	☐	☐
Item 2	☐	☐	☐	☐	☐	☐
Item 3	☐	☐	☐	☐	☐	☐
ENVIRONMENTAL QUALITY						
Fireplaces						
4.503.1 Any installed gas fireplace shall be a direct-vent sealed-combustion type. Any installed woodstove or pellet stove shall comply with US EPA Phase II emission limits where applicable. Woodstoves, pellet stoves and fireplaces shall also comply with applicable local ordinances.	☒			☐	☐	☐
Pollutant Control						
4.504.1 Duct openings and other related air distribution component openings shall be covered during construction.	☒			☐	☐	☐
4.504.2.1 Adhesives, sealants and caulks shall be compliant with VOC and other toxic compound limits.	☒			☐	☐	☐
4.504.2.2 Paints, stains and other coatings shall be compliant with VOC limits.	☒			☐	☐	☐
4.504.2.3 Aerosol paints and coatings shall be compliant with product weighted MIR limits for ROC and other toxic compounds.	☒			☐	☐	☐
4.504.2.4 Documentation shall be provided to verify that compliant VOC limit finish materials have been used.	☒			☐	☐	☐

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
4.504.3 Carpet and carpet systems shall be compliant with VOC limits.	☒			☐	☐	☐
4.504.4 50 percent of floor area receiving resilient flooring shall comply with the VOC-emission limits defined in the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List or be certified under the Resilient Floor Covering Institute (RFCI) FloorScore program.	☒					
4.504.5 Particleboard, medium density fiberboard (MDF) and hardwood plywood used in interior finish systems shall comply with low formaldehyde emission standards.	☒			☐	☐	☐
A4.504.1 Meet the formaldehyde limits contained in Table 4.504.5 before the mandatory compliance date, or use composite wood products made with either California Air Resources Board approved no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins.		☐	☐	☐	☐	☐
A4.504.2 Install VOC compliant resilient flooring systems. Tier 1. At least 80 percent of the resilient flooring installed shall comply. Tier 2. At least 90 percent of the resilient flooring installed shall comply.		☒[2]	☒[2]	☐	☐	☐
A4.504.3 Thermal insulation installed in the building shall meet the following requirements: Tier 1. Install thermal insulation in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List. Tier 2. Install insulation which contains No-Added Formaldehyde (NAF) and is in compliance with the VOC-emission limits defined in Collaborative for High Performance Schools (CHPS) Low-emitting Materials List.		☒[2]	☒[2]	☐	☐	☐
Interior Moisture Control						
4.505.2 Vapor retarder and capillary break is installed at slab on grade foundations.	☒			☐	☐	☐
4.505.3 Moisture content of building materials used in wall and floor framing is checked before enclosure.	☒			☐	☐	☐
Indoor Air Quality and Exhaust						
4.506.1 Exhaust fans which terminate outside the building are provided in every bathroom.	☒			☐	☐	☐
A4.506.1 Higher than MERV 6 filters are installed on central air or ventilation systems.		☐	☐	☐	☐	☐
A4.506.2 Direct vent appliances are used or isolated from the conditioned space.		☐	☐	☐	☐	☐

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
Environmental Comfort						
4.507.1 Whole house exhaust fans shall have insulated louvers or covers which close when the fan is off. Covers or louvers shall have a minimum insulation value of R-4.2.	☒			☐	☐	☐
4.507.2. Duct systems are sized, designed, and equipment is selected using the following methods: 1. Establish heat loss and heat gain values according to ACCA Manual J or equivalent. 2. Size duct systems according to ACCA 29-D (Manual D) or equivalent. 3. Select heating and cooling equipment according to ACCA 36-S (Manual S) or equivalent.	☒			☐	☐	☐
Outdoor Air Quality **Reserved**						
Innovative Concepts and Local Environmental Conditions						
A4.509.1 Items in this section are necessary to address innovative concepts or local environmental conditions.						
Item 1		☐	☐	☐	☐	☐
Item 2		☐	☐	☐	☐	☐
Item 3		☐	☐	☐	☐	☐
Installer and Special Inspector Qualifications						
Qualifications						
702.1 HVAC system installers are trained and certified in the proper installation of HVAC systems.	☒			☐	☐	☐
702.2 Special inspectors employed by the enforcing agency must be qualified and able to demonstrate competence in the discipline they are inspecting.	☒			☐	☐	☐
Verifications						
703.1 Verification of compliance with this code may include construction documents, plans, specifications builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which show substantial conformance.	☒			☐	☐	☐

1. Green building measures listed in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
2. Required prerequisite for this Tier.

Division A4.7– RESIDENTIAL MODEL ORDINANCE

A4.701.1 General. The voluntary measures of this code are designed and promulgated to be adopted by reference and made mandatory by local ordinance pursuant to Section 101.7. Jurisdictions wishing to adopt the voluntary provisions of this code as an enforceable regulation governing structures and premises should ensure that certain factual information is included in the adopting ordinance and that the measures are appropriate and achievable and are considered to be suitable as mandatory by the city, county, or city and county. The following sample adoption ordinance addresses several key elements of a code adoption ordinance, including the information required for insertion into the code text.

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.

SAMPLE RESOLUTION FOR ADOPTION OF THE TIER 1 OR TIER 2 PROVISIONS OF THE CALIFORNIA GREEN BUILDING STANDARDS CODE WITH OR WITHOUT ADDITIONAL ITEMS NECESSARY TO ADDRESS INNOVATIVE CONCEPTS OR LOCAL ENVIRONMENTAL CONDITIONS.

ATTACHMENT___.

SAMPLE RESOLUTION ADOPTING THE CALIFORNIA GREEN BUILDING STANDARDS CODE APPENDICES AS A MANDATORY REFERENCE STANDARD

CITY OF _____

RESOLUTION # _____

RESOLUTION ADOPTING ENHANCED GREEN BUILDING MEASURES FOR NEW HOME CONSTRUCTION.

WHEREAS, the City/County of _____ 's (City or County) General Plan sets forth goals for preserving and improving the natural and built environment of the City/County, protecting the health of its residents and visitors, and fostering its economy; and

WHEREAS, green building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community; and

WHEREAS, green buildings benefit building industry professionals, residents, and communities by improving construction quality; increasing building durability; reducing utility, maintenance, water and energy costs; creating healthier homes; and enhancing comfort and livability; and

WHEREAS, the *California Green Building Standards Code* appendices have included voluntary tiers to provide a city, county, or city and county, building professionals, and the general public with a range of voluntary green building measures for builders to choose from when constructing homes in California; and

WHEREAS, the *California Green Building Standards Code* appendices benefited from extensive input from a city, county, or city and county, building professionals, State agencies, and recognized green building professionals and the practices contained in these guidelines were selected for their viability in today's market and their ability to promote sustainable buildings and communities; and

WHEREAS, adoption of the *California Green Building Standards Code* appendices promotes statewide consistency and predictability for building professionals; and

NOW THEREFORE, BE IT RESOLVED, that the City/County hereby finds that green building design, construction and operation furthers the goals set forth in the City's General Plan, including land use, conservation, open space and (include others, if applicable.)

NOW THEREFORE, BE IT RESOLVED, that newly constructed low-rise residential buildings shall meet the _____ (Tier 1 or Tier 2) measures contained in the *California Green Building Standards Code* appendices and the green building design, construction, and operation innovative concepts or additions or amendment thereto contained in Attachment _____ to address local environmental conditions; and;

NOW THEREFORE, BE IT FURTHER RESOLVED, that the City Council or County Board of Supervisors of the City/County of _____ adopts the *California Green Building Standards Code* appendices, as they may be amended from time to time, as a City/County mandatory reference document and directs City staff to enforce these green building measures as mandatory standards within the City/County.

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSENT:

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)	X																		
Adopt only those sections that are listed below							X	X	X		X								
Chapter/Section																			
Appendix A5 – First paragraph under Nonresidential Voluntary Measures title.							X												
A5.101.1							X												
A5.102.1 Definitions							X												
A5.106.4	†						X												
A5.106.4.1	†						X												
A5.106.4.2	†						X												
A5.106.4.3							X												
Table A5.106.4.3							X												
A5.106.5.1							X												
Table A5.106.5.1.1							X												
A5.106.5.1.3							X												
A5.106.5.1.4							X												
A5.106.5.3							X												
A5.106.5.3.1							X												
Table A5.106.5.3.1							X												
A5.106.6							X												
A5.106.6.1							X												
A5.106.7							X												
A5.106.9							X	X	X		X								
A5.106.9.1	†						X												
A5.106.11							X												
A5.106.11.1							X												
A5.106.11.2 and subsections							X												
A5.106.11.2.1							X												

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

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

SECTION A5.102 DEFINITIONS

A5.102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

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

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

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

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

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

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

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.

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

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

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

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

1. Zero emission vehicle (ZEV), including neighborhood electric vehicles (NEV), partial zero emission vehicle

(PZEV), advanced technology PZEV (AT ZEV) or CNG fueled (original equipment manufacturer only) regulated under *Health and Safety Code* section 43800 and CCR, Title 13, Sections 1961 and 1962.

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

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

PERMEABLE PAVING. [BSC] 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.

PZEV. Any vehicle certified by the California Air Resources Board as a Partial Credit Zero Emission Vehicle.

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

Note: Source: *Vehicle Code*, Division 1, Section 668

ZEV. Any vehicle certified to zero emission standards.

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 and quantity in conformance with Section A5.106.2.1 and storm water runoff quality by Section A5.106.3.2 or by local requirements, whichever are stricter.

A5.106.2.1 Storm water runoff rate and quantity. Implement a storm water management plan resulting in no net increase in rate and quantity of storm water runoff from existing to developed conditions.

Exception: If the site is already greater than 50 percent impervious, implement a storm water management plan resulting in a 25 percent decrease in rate and quantity.

A5.106.2.2 Storm water runoff quality. Use postconstruction treatment control best management practices (BMPs) to mitigate (infiltrate, filter or treat) storm water runoff from the 85th percentile 24-hour runoff event (for volume-based BMPs) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMPs).

A5.106.3 Low impact development (LID). Reduce peak runoff in compliance with Section 5.106.3.1. Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to:

1. Bioretention (rain gardens);
2. Cisterns and rain barrels;
3. Green roofs meeting the structural requirements of the building code;
4. Roof leader disconnection;
5. Permeable and porous paving;
6. Vegetative swales and filter strips; tree preservation; and
7. 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 Bicycle parking and changing rooms. Comply with Sections A5.106.4.1 through A5.106.4.3; or meet local ordinance or the University of California Policy on Sustainable Practices, whichever is stricter.

A5.106.4.1 Short-term bicycle parking. If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.

A5.106.4.2 Long-term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupant motorized vehicle parking capacity, with a minimum of one space. For public schools and community colleges, provide secure bicycle parking for 15 percent of occupants (students, teachers and staff). Acceptable parking facilities shall be convenient from the street and may include, but not be limited to:

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

A5.106.4.3 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.

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

TABLE A5.106.4.3

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

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

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

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

TABLE A5.106.5.1.1
TIER 1
10 PERCENT OF TOTAL SPACES [DSA-SS]

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

TABLE A5.106.5.1.2
TIER 2
12 PERCENT OF TOTAL SPACES

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
VEHICLE

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

Notes:

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

A5.106.5.3 Electric vehicle charging. Provide facilities meeting Section 406.7 (Electric Vehicle) of the *California Building Code* and as follows:

A5.106.5.3.1 Electric vehicle supply wiring. For each space required in Table A5.106.5.3.1, provide one 120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets.

TABLE A5.106.5.3.1

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

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

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

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

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

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

A5.106.7 Exterior wall shading. Meet requirements in the current edition of the *California Energy Code* and select one of the following for wall surfaces:

1. Provide vegetative or man-made shading devices for east-, south- and west-facing walls with windows, with 30 percent coverage to a height of 20 feet or top of exterior wall, whichever is less, for east and west walls. Calculate shade coverage on the summer solstice at 10 AM for east-facing walls and at 3 PM for west-facing walls. Plant vegetative shade of species documented to reach desired coverage within 5 years of building occupancy.
2. Use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.

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

Note: If not available from the manufacturer, aged SRI value calculations may be found at the California Energy Commission's web site at www.energy.ca.gov.

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

1. When site and location permit orient the building with the long sides facing north and south.
2. Protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, snow and leaves with building orientation and landscape features.

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

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

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

A5.106.11 Heat island effect. Reduce nonroof heat islands by Section A5.106.11.1 and roof heat islands by Section A5.106.11.2 or [DSA-SS] A5.106.11.4.

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

1. Provide shade (mature within 5 years of occupancy). [DSA-SS] In Public School and Community College buildings, solar shade structures may be used in lieu of trees to provide required shade.
2. Use light colored/ high-albedo materials.
3. Use open-grid pavement system.

A5.106.11.2 Cool roof. Use roofing materials having a minimum 3-year aged solar reflectance and thermal emittance complying with Sections A5.106.11.2.1 and A5.106.11.2.2 or a minimum aged Solar Reflectance Index (SRI)3 complying with Section A5.106.11.2.3 and as shown in Table A5.106.11.2.1 or A5.106.11.2.2.

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

If CRRC testing for 3-year aged reflectance is not available for any roofing products, the 3-year aged value shall be determined using the Cool Roof Rating Council (CRRC) certified initial value using the equation R_{aged} = [0.2 + 0.7[$\rho_{initial}$ – 0.2], where $\rho_{initial}$ = the initial Solar Reflectance.

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

A5.106.11.2.2 Thermal emittance. Roofing materials shall have a CRRC initial or 3-year aged thermal emittance equal to or greater than those specified in Table A5.106.11.2.1 for Tier 1 and Table A5.106.11.2.2 for Tier 2.

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

A5.106.11.2.3 Solar reflectance index alternative. Solar Reflectance Index (SRI) equal to or greater than the values specified in Table A5.106.11.2.1 for Tier 1 and Table A5.106.11.2.2 for Tier 2 may be used as an alternative to compliance with the 3-year aged solar reflectance values and thermal emittance.

SRI values used to comply with this section shall be calculated using the Solar Reflective Index (SRI) Calculation Worksheet (SRI-WS) developed by the California Energy Commission or in compliance with ASTM E 1980-01 as specified in Title 24, Part 6, Section 118(i)3. Solar reflectance values used in the SRI-WS shall be based on the 3-year aged reflectance value of the roofing product or the equation in section A5.106.11.2.1 if the CRRC certified aged solar reflectance are not available. Certified Thermal emittance used in the SRI-WS may be either the initial value or the three year aged value listed by the CRRC.

TABLE A5.106.11.2.1
TIER 1 [BSC]

ROOF SLOPE	ROOF WEIGHT	CLIMATE ZONE	Minimum 3-year Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2 : 12	N.A	13 & 15	0.55	0.75	64
> 2 : 12	< 5 lb/ft^2	10–15	0.20	0.75	16
	≤ 5 lb/ft^2	1–16	0.15	0.75	10

TABLE A5.106.11.2.2
TIER 2

ROOF SLOPE	ROOF WEIGHT	CLIMATE ZONE	Minimum 3-year Aged Solar Reflectance	Thermal Emittance	SRI
≤ 2 : 12	N/A	2, 4, 6–15	0.65	0.85	78
> 2 : 12	N/A	2, 4, 6–15	0.23	0.85	20

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

Note: The Solar Reflective Index Calculation Worksheet (SRI-WS) is available by contacting the Energy Standard Hotline at 1-800-772-3300 or by email at Title24@energy.state.ca.us.

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

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES
DIVISION A5.2 – ENERGY EFFICIENCY

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	**X**						**X**	**X**	**X**		**X**								
Chapter/Section																			
A5.201.1	X						X												
A5.202.1 Definitions	X						X												
A5.203.1and subsections	X						X												
A5.203.2 and subsections								X											
A5.204.1	X						X	X	X		X								
A5.204.2 and subsections	X						X												
A5.204.3 and subsections	X																		
A5.204.4 and subsections								X			X								
A5.204.6	X							X	X		X								
A5.205 and subsections and tables								X			X								
A5.207 and subsections and tables								X	X		X								
A5.209 and subsections and tables								X	X		X								
A5.210								X	X		X								
A5.211.1	X						X												
A5.211.1.1	X						X												
A5.211.1.2 and subsections							X												
A5.211.3	X						X												
A5.211.4 and subsection	X						X												
A5.212	X						X												
A5.213	X																		

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.2 – ENERGY EFFICIENCY

SECTION A5.201
GENERAL

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

SECTION A5.202
DEFINITIONS

A5.202.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

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

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

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

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

OVERCURRENT PROTECTION DEVICE RATING. The highest current at rated voltage that an overcurrent protection device is intended to interrupt under standard test conditions.

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.

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 cost 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.

SECTION A5.203
PERFORMANCE APPROACH

A5.203.1 Energy performance. For the purposes of energy efficiency standards in this code the California Energy Commission will continue to adopt mandatory building standards. It is the intent of this code to encourage green buildings to achieve exemplary performance in the area of energy efficiency. Specifically, a green building should achieve more than a 15 percent reduction in energy usage when compared to the State's mandatory energy efficiency standards.

Using an Alternative Calculation Method approved by the California Energy Commission, calculate each nonresidential building's TDV energy and CO_2 emissions and compare it to the standard or "budget" building.

A5.203.1.1 Tier 1 [BSC] Energy efficiency – 15 percent above Title 24, Part 6. [DSA-SS] Exceed *California Energy Code* requirements, based on the 2008 *Energy Efficiency Standards*, by 15 percent and meet the requirements of Division A45.6.

A5.203.1.2 Tier 2 [BSC] Energy efficiency – 30 percent above Title 24, Part 6. [DSA-SS] Exceed *California Energy Code* requirements, based on the 2008 *Energy Efficiency Standards*, by 30 percent and meet the requirements of Division A45.6.

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

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

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

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

SECTION A5.204
PRESCRIPTIVE APPROACH

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

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

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

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

A5.204.3 Demand response. HVAC systems with Direct Digital Control Systems and centralized lighting systems shall include preprogrammed demand response strategies that are automated with either a Demand Response Automation Internet Software Client or dry contact relays.

A5.204.3.1 HVAC. The preprogrammed demand response strategies shall be capable of reducing the peak HVAC demand by cooling temperature set point adjustment.

A5.204.3.2 Lighting. The preprogrammed demand response strategies shall be capable of reducing the total lighting load by a minimum 30 percent through dimming control or bi-level switching.

A5.204.3.3 Software clients. The software clients shall be capable of communicating with a DR Automation Server.

A5.204.4 Commissioning. Building commissioning shall be included in the design and construction processes of the building project to verify that the building's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design and construction documents.

The owner and designer shall designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities. The owner shall document the Owner's Project Requirements (OPR). The design team shall develop the Basis of Design (BOD). The CxA shall review these documents for clarity and completeness. The owner and design team shall be responsible for updates to their respective documents, develop and incorporate commissioning requirements into the construction documents and develop and implement a commissioning plan. The CxA shall verify the installation and performance of the systems to be commissioned, verify that training and operation and maintenance documentation have been provided to the owner's operations staff and complete a commissioning report.

Commissioning process activities shall be completed for the following energy-related systems, at a minimum:

1. Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
2. Lighting and daylighting controls
3. Domestic hot water systems
4. Renewable energy systems (wind, solar, etc.)
5. Building envelope systems

A5.204.4.1 Owner's Project Requirements (OPR). The expectations and requirements of the building shall be documented by the owner and the designer before the design phase of the project begins. This shall be reviewed by the CxA. At a minimum, this documentation shall include the following:

1. Environmental and sustainability goals
2. Energy efficiency goals
3. Indoor environmental quality requirements
4. Equipment and systems expectations
5. Building occupant and O&M personnel expectations

A5.204.4.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the Owner's Project Requirements shall be completed at the design phase of the building project and updated as necessary during the design and construction phases. This shall be reviewed by the CxA. At a minimum, the Basis of Design document shall cover the following systems:

1. Heating, ventilation, air conditioning (hvac) systems and controls
2. Indoor lighting system and controls
3. Water heating system
4. Renewable energy systems

A5.204.4.3 Commissioning plan. A commissioning plan shall be completed to document the approach to how the project will be commissioned and shall be started during the design phase of the building project. This shall be reviewed by the CxA. The Commissioning Plan shall include the following at a minimum:

1. General project information
2. Commissioning goals
3. Systems to be commissioned. Plans to test systems and components shall include at a minimum:
    a. A detailed 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; and
    e. Measurable criteria for acceptable performance.
4. Commissioning team information

5. Commissioning process activities, schedules and responsibilities – plans for the completion of commissioning requirements listed in Sections A5.204.4.4 through A5.204.4.6 shall be included.

A5.204.4.4 Functional performance testing. 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. This shall be reviewed and verified by the CxA.

A5.204.4.5 Postconstruction documentation and training. A systems manual and systems operations training are required.

A5.204.4.5.1 Systems manual. Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner and facilities operator. This shall be reviewed by the CxA. At a minimum, 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. Other resources and documentation

A5.204.4.5.2 Systems operations training. The CxA shall oversee the training of the appropriate maintenance staff for each equipment type and/or system. The training shall include, as a minimum, the following:

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

A5.204.4.6 Commissioning report. The CxA shall create a complete report of commissioning process activities undertaken through the design, construction and postconstruction phases of the building project and provided to the owner.

A5.204.6 Building orientation and shading. Locate orient and shade the building as required in Section A5.106.9.

SECTION A5.205
BUILDING ENVELOPE

A5.205.1 Fenestration products and exterior doors.

A5.205.1.1 Certification of fenestration products and exterior doors other than field-fabricated. Any fenestration product and exterior door, other than field-fabricated fenestration products and field-fabricated exterior doors, may be installed only if the manufacturer has certified to the California Energy Commission or if an independent certifying organization approved by the Commission has certified that the product complies with all of the applicable requirements of this subsection.

A5.205.1.1.1 Air leakage. Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft² of window area, 0.3 cfm/ft² of door area for residential doors, 0.3 cfm/ft² of door area for nonresidential single doors (swinging and sliding) and 1.0 cfm/ft² for nonresidential double doors (swinging), when tested according to NFRC-400 or ASTM E 283 at a pressure differential of 75 pascals (or 1.57 pounds/ft²), incorporated herein by reference.

A5.205.1.1.2 *U*-factor. A fenestration product's *U*-factor shall be rated in accordance with NFRC 100 or the applicable default *U*-factor set forth in Table A.5.205.1-A.

Exception: If the fenestration product is a skylight or is site-built fenestration in a building covered by the nonresidential standards with less than 10,000 square feet of site-built fenestration, the default *U*-factor may be calculated as set forth in Reference Nonresidential Appendix NA6 of the California Energy Commission 2008 *Building Energy Efficiency Standards for Residential and Nonresidential Buildings*.

A5.205.1.1.3 SHGC. A fenestration product's SHGC shall be rated in accordance with NFRC 200 for site-built fenestration or use the applicable default SHGC set forth in Table A5.205.1-B.

Exception: If the fenestration product is a skylight or is site-built fenestration in a building covered by the nonresidential standards with less than 10,000 square feet of site-built fenestration, the default SHGC may be calculated as set forth in Reference Nonresidential Appendix NA6 of the California Energy Commission 2008 *Building Energy Efficiency Standards for Residential and Nonresidential Buildings.*

A5.205.1.1.4 Labeling. Fenestration products shall:

1. Have a temporary label (or label certificate for site-built fenestration) meeting the requirements of Section 10-111(a)1 of Title 24, Part 1 not to be removed before inspection by the enforcement agency, listing the certified *U*-factor and SHGC and certifying that the air leakage requirements of Section A5.205.1.1.1 are met for each product line; and
2. Have a permanent label (or label certificate for site-built fenestration) meeting the requirements

of Section 10-111(a)2 of Title 24, Part 1 if the product is rated using NFRC procedures.

A5.205.1.1.5 Fenestration acceptance requirements. Before an occupancy permit is granted, site-built fenestration products in other than low-rise residential buildings shall be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Reference Nonresidential Appendix NA7 of the California Energy Commission 2008 *Building Energy Efficiency Standards for Residential and Nonresidential Buildings* to ensure that site-built fenestration meet Standards requirements, including a matching label certificate for each product installed and be readily accessible at the project location. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the fenestration product meets the acceptance requirements.

Exception: Fenestration products removed and reinstalled as part of a building alteration or addition.

TABLE A.5.205.1-A
DEFAULT FENESTRATION PRODUCT *U*-FACTORS

FRAME	PRODUCT TYPE	SINGLE PANE *U*-FACTOR	DOUBLE PANE[1] *U*-FACTOR	GLASS BLOCK[2] *U*-FACTOR
Metal	Operable	1.28	0.79	0.87
	Fixed	1.19	0.71	0.72
	Greenhouse/garden window	2.26	1.40	N.A.
	Doors	1.25	0.77	N.A.
	Skylight	1.98	1.30	N.A.
Metal, thermal break	Operable	N.A.	0.66	N.A.
	Fixed	N.A.	0.55	N.A.
	Greenhouse/garden window	N.A.	1.12	N.A.
	Doors	N.A.	0.59	N.A.
	Skylight	N.A.	1.11	N.A.
Nonmetal	Operable	0.99	0.58	0.60
	Fixed	1.04	0.55	0.57
	Doors	0.99	0.53	N.A.
	Greenhouse/garden windows	1.94	1.06	N.A.
	Skylight	1.47	0.84	N.A.

1. For all dual-glazed fenestration products, adjust the listed *U*-factors as follows:
   a. Add 0.05 for products with dividers between panes if spacer is less than $^{7}/_{16}$ inch wide.
   b. Add 0.05 to any product with true divided lite (dividers through the panes).
2. Translucent or transparent panels shall use glass blocks.

TABLE A5.205.1-B
DEFAULT SOLAR HEAT GAIN COEFFICIENT (SHGC)

FRAME TYPE	PRODUCT	GLAZING	TOTAL WINDOW SHGC		
			Single Pane	Double Pane	Glass Block[1]
Metal	Operable	Clear	0.80	0.70	0.70
	Fixed	Clear	0.83	0.73	0.73
	Operable	Tinted	0.67	0.59	N.A.
	Fixed	Tinted	0.68	0.60	N.A.
Metal, thermal break	Operable	Clear	N.A.	0.63	N.A.
	Fixed	Clear	N.A.	0.69	N.A.
	Operable	Tinted	N.A.	0.53	N.A.
	Fixed	Tinted	N.A.	0.57	N.A.
Nonmetal	Operable	Clear	0.74	0.65	0.70
	Fixed	Clear	0.76	0.67	0.67
	Operable	Tinted	0.60	0.53	N.A.
	Fixed	Tinted	0.63	0.55	N.A.

1. Translucent or transparent panels shall use glass block values.

A5.205.1.2 Installation of field-fabricated fenestration and exterior doors. Field-fabricated fenestration and field-fabricated exterior doors may be installed only if the compliance documentation has demonstrated compliance for the installation using *U*-factors from Table A5.205.1-A and SHGC values from Table A5.205.1-B. Field-fabricated fenestration and field-fabricated exterior doors shall be caulked between the fenestration products or exterior door and the building and shall be weatherstripped.

Exception: Unframed glass doors and fire doors need not be weatherstripped or caulked.

A5.205.2 Joints and other openings. Joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weatherstripped or otherwise sealed to limit infiltration and exfiltration.

A5.205.3 Insulation and roofing products.

A5.205.3.1 Certification by manufacturers. Any insulation shall be certified by Department of Consumer Affairs, Bureau of Home Furnishing and Thermal Insulation that the insulation conductive thermal performance is approved pursuant to the *California Code of Regulations,* Title 24, Part 12, Chapters 12-13, Article 3,"Standards for Insulating Material."

A5.205.3.2 Installation of urea formaldehyde foam insulation. Urea formaldehyde foam insulation may be applied or installed only if:

1. It is installed in exterior side walls; and
2. A four-mil-thick plastic polyethylene vapor barrier or equivalent plastic sheathing vapor barrier is installed between the urea formaldehyde foam insulation and the interior space in all applications.

A5.205.3.3 Flame spread rating. All insulating material shall be installed in compliance with the flame spread rating and smoke density requirements of the Title 24, Part 2, *California Building Code.*

A5.205.3.4 Installation of insulation in existing buildings. Insulation installed in an existing attic or on an existing duct or water heater, shall comply with the applicable requirements of Subsections A5.205.3.4.1, A5.205.3.4.2 and A5.205.3.4.3 below. If a contractor installs the insulation, the contractor shall certify to the customer, in writing, that the insulation meets the applicable requirements of Subsections A5.205.3.4.1, A5.205.3.4.2 and A5.205.3.4.3 below.

A5.205.3.4.1 Attics. If insulation is installed in the existing attic of a low-rise residential building, the *R*-value of the total amount of insulation (after addition of insulation to the amount, if any, already in the attic) shall be at least R-38 in climate zones 1 and 16; and R-30 in all other climate zones.

Exception: Where the accessible space in the attic is not large enough to accommodate the required *R*-value, the entire accessible space shall be filled with insulation provided such installation does not violate Section 1203.2 of Title 24, Part 2, *California Building Code*.

A5.205.3.4.2 Water heaters. If external insulation is installed on an existing unfired water storage tank or on an existing back-up tank for a solar water-heating system, it shall have an *R*-value of at least R-12 or the heat loss of the tank surface based on an 80°F water-air temperature difference shall be less than 6.5 Btu per hour per square foot.

A5.205.3.4.3 Ducts. If insulation is installed on an existing space-conditioning duct, it shall comply with Section 605 of the CMC.

A5.205.3.5 Placement of roof/ceiling insulation. Insulation installed to limit heat loss and gain through the top of conditioned spaces shall comply with the following:

A5.205.3.5.1 Insulation shall be installed in direct contact with a continuous roof or ceiling which is sealed to limit infiltration and exfiltration as specified in Section A5.205.2, including but not limited to placing insulation either above or below the roof deck or on top of a drywall ceiling; and

A5.205.3.5.2 When insulation is installed at the roof in nonresidential buildings, fixed vents or openings to the outdoors or to unconditioned spaces shall not be installed and the space between the ceiling and the roof is either directly or indirectly conditioned space and shall not be considered an attic for the purposes of complying with CBC attic ventilation requirements; and

A5.205.3.5.3 Insulation placed on top of a suspended ceiling with removable ceiling panels shall be deemed to have no affect on envelope heat loss; and

Exception: When there are conditioned spaces with a combined floor area no greater than 2,000 square feet in an otherwise unconditioned building and when the average height of the space between the ceiling and the roof over these spaces is greater than 12 feet, insulation placed in direct contact with a suspended ceiling with removable ceiling panels shall be an acceptable method of reducing heat loss from a conditioned space and shall be accounted for in heat loss calculations.

A5.205.3.5.4 Insulation shall be installed below the roofing membrane or layer used to seal the roof from water penetration unless the insulation has a maximum water absorption of 0.3 percent by volume when tested according to ASTM Standard C 272.

Note: Vents, which do not penetrate the roof deck, that are designed for wind resistance for roof membranes are not within the scope of Section A5.205.3.5.2.

A5.205.3.6 Demising walls in nonresidential buildings. The opaque portions of framed demising walls in nonresidential buildings shall be insulated with an installed *R*-value of no less than R-13 between framing members.

A5.205.3.7 Insulation requirements for heated slab floors. Heated slab-on-grade floors shall be insulated according to the requirements in Table A5.205.3-A.

A5.205.3.7.1 Insulation materials in ground contact must:

A5.205.3.7.1.1 Comply with the certification requirements of Section A5.205.3.1 and

A5.205.3.7.1.2 Have a water absorption rate for the insulation material alone without facings that is no greater than 0.3 percent when tested in accordance with Test Method A – 24 Hour-Immersion of ASTM C 272.

A5.205.3.7.2 Insulation installation must:

A5.205.3.7.2.1 Cover the insulation with a solid guard that protects against damage from ultraviolet radiation, moisture, landscaping operation, equipment maintenance and wind; and

A5.205.3.7.2.2 Include a rigid plate, which penetrates the slab and blocks the insulation from acting as a conduit for insects from the ground to the structure above the foundation.

A5.205.3.8 Wet insulation systems. When insulation is installed on roofs above the roofing membrane or layer used to seal the roof from water penetration, the effective *R*-value of the insulation shall be as specified in Reference Joint Appendix JA4 of the California Energy Commission 2008 *Building Energy Efficiency Standards for Residential and Nonresidential Buildings*.

A5.205.3.9 Roofing products solar reflectance and thermal emittance.

A5.205.3.9.1 In order to meet the requirements of Sections 141, 142, 143(a)1, 149(b)1B, 151(f)12, 152(b)1H or 152(b)2 of Title 24, Part 6, a roofing product's thermal emittance and 3-year aged solar reflectance shall be certified and labeled according to the requirements of Section 10-113 of Title 24, Part 1.

Exception: Roofing products that are not certified according to Section 10-113 of Title 24, Part 1 shall assume the following default aged reflectance/emittance values:

A5.205.3.9.1.1 For asphalt shingles, 0.08/0.75

A5.205.3.9.1.2 For all other roofing products, 0.10/0.75

A5.205.3.9.2 If CRRC testing for 3-year aged reflectance is not available for any roofing products, the 3-year aged value shall be derived from the CRRC initial value using the equation $R_{aged} = [0.2 + 0.7[\rho_{initial} – 0.2]$, where $\rho_{initial}$ = the initial Solar Reflectance.

A5.205.3.9.3 Solar Reflectance Index (SRI), calculated as specified by ASTM E 1980-01, may be used as an alternative to thermal emittance and 3-year aged solar reflectance when complying with the requirements of Sections 141, 142, 143(a)1, 149(b)1B, 151(f)12, 152(b)1H or 152(b)2 of Title 24, Part 6. SRI calculations shall be based on moderate wind velocity of 2-6 meters per second. The SRI shall be calculated based on the 3-year aged reflectance value of the roofing products.

A5.205.3.9.4 Liquid applied roof coatings applied to low-sloped roofs in the field as the top surface of a roof covering shall:

A5.205.3.9.4.1 Be applied across the entire roof surface to meet the dry mil thickness or coverage recommended by the coating manufacturer, taking into consideration the substrate on which the coating is applied and

A5.205.3.9.4.2 Meet the minimum performance requirements listed in Table A5.205.3-B or the minimum performance requirements of ASTM C 836, D 3468, D 6083 or D 6694, whichever are appropriate to the coating material.

Exceptions:

1. Aluminum-pigmented asphalt roof coatings shall meet the requirements of ASTM D 2824 or ASTM D 6848 and be installed as specified by ASTM D 3805.
2. Cement-based roof coatings shall contain a minimum of 20 percent cement and shall meet the requirements of ASTM C 1583, ASTM D 822 and ASTM D 5870.

TABLE A5.205.3-A
SLAB INSULATION REQUIREMENTS FOR HEATED SLAB-ON-GRADE

INSULATION LOCATION	INSULATION ORIENTATION	INSTALLATION REQUIREMENTS	CLIMATE ZONE	INSULATION R-FACTOR
Outside edge of heated slab, either inside or outside the foundation wall	Vertical	From the level of the top of the slab, down 16 inches or to the frost line, whichever is greater. Insulation may stop at the top of the footing where this is less than the required depth. For below grade slabs, vertical insulation shall be extended from the top of the foundation wall to the bottom of the foundation (or the top of the footing) or to the frost line, whichever is greater.	1 – 15	5
			16	10
Between heated slab and outside foundation wall	Vertical and Horizontal	Vertical insulation from top of slab at inside edge of outside wall down to the top of the horizontal insulation. Horizontal insulation from the outside edge of the vertical insulation extending 4 feet toward the center of the slab in a direction normal to the outside of the building in plan view.	1 – 15	5
			16	10 vertical and 7 horizontal

TABLE A5.205.3-B
MINIMUM PERFORMANCE REQUIREMENTS FOR LIQUID APPLIED ROOF COATINGS

PHYSICAL PROPERTY	ASTM TEST PROCEDURE	REQUIREMENT
Initial percent elongation (break)	D 2370	Minimum 200 percent 73ºF (23ºC)
Initial percent elongation (break) OR Initial flexibility	D 2370 D 522, Test B	Minimum 60 percent 0ºF (-18ºC) Minimum pass 1″ mandrel 0ºF (-18ºC)
Initial tensile strength (maximum stress)	D 2370	Minimum 100 psi (1.38 Mpa) 73ºF (23ºC)
Initial tensile strength (maximum stress) OR Initial flexibility	D 2370 D 522, Test B	Minimum 200 psi (2.76 Mpa) 0ºF (-18ºC) Minimum pass 1″ mandrel 0ºF (-18ºC)
Final percent elongation (break) after accelerated weathering 1000 h	D 2370	Minimum 100 percent 73ºF (23ºC)
Final percent elongation (break) after accelerated weathering 1000 h OR Flexibility after accelerated weathering 1000 h	D 2370	Minimum 40 percent 0ºF (-18ºC) Minimum pass 1″ mandrel 0ºF (-18ºC)
Permeance	D 1653	Maximum 50 perms
Accelerated weathering 1000 h	D 4798	No cracking or checking[1]

1. Any cracking or checking visible to the eye fails the test procedure.

SECTION A5.207
HVAC DESIGN, EQUIPMENT AND INSTALLATION

A5.207.1 Space-conditioning equipment certification by manufacturers. Any space-conditioning equipment listed in this section may be installed only if the manufacturer has certified that the equipment complies with all the applicable requirements of this section.

A5.207.1.1 Efficiency. Equipment shall meet the applicable requirements in Tables A5.207.1-A through A5.207.1-M, subject to the following:

1. If more than one standard is listed for any equipment in Tables A5.207.1-A through A5.207.1-M, the equipment shall meet all the applicable standards that are listed; and
2. If more than one test method is listed in Tables A5.207.1-A through A5.207.1-M, the equipment shall comply with the applicable standard when tested with each test method; and
3. Where equipment can serve more than one function, such as both heating and cooling or both space heating and water heating, it shall comply with all the requirements applicable to each function; and
4. Where a requirement is for equipment rated at its "maximum rated capacity" or "minimum rated capacity," the capacity shall be as provided for and allowed by the controls, during steady-state operation.

Exception: Water-cooled centrifugal water-chilling packages that are not designed for operation at ARI Standard 550 test conditions of 44°F leaving chilled water temperature and 85°F entering condenser water temperature shall have a minimum full load COP rating as shown in Tables A5.207.1-H, A5.207.1-I and A5.207.1-J and a minimum NPLV rating as shown in Tables A5.207.1-K, A5.207.1-L and A5.207.1-M. The table values are only applicable over the following full load design ranges:

Leaving Chiller Water Temperature	40 to 48°F
Entering Condenser Water Temperature	75 to 85°F
Condensing Water Temperature Rise	5 to 15°F

A5.207.1.2 Controls for heat pumps with supplementary electric resistance heaters. Heat pumps with supplementary electric resistance heaters shall have controls:

A5.207.1.2.1 That prevent supplementary heater operation when the heating load can be met by the heat pump alone; and

A5.207.1.2.2 In which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.

Exceptions: The controls may allow supplementary heater operation during:

1. Defrost; and
2. Transient periods such as start-ups and following room thermostat setpoint advance, if the controls provide preferential rate control, intelligent recovery, staging, ramping or another control mechanism designed to preclude the unnecessary operation of supplementary heating.

A5.207.1.3 Thermostats. All unitary heating and/or cooling systems including heat pumps that are not controlled by a central energy management control system (EMCS) shall have a setback thermostat.

1. **Setback capabilities.** All thermostats shall have a clock mechanism that allows the building occupant to

program the temperature set points for at least four periods within 24 hours. Thermostats for heat pumps shall meet the requirements of Section A5.207.1.2.

Exception: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, noncentral electric heaters, fireplaces or decorative gas appliances, wood stoves, room air conditioners and room air-conditioner heat pumps need not comply with this requirement. Additionally, room air-conditioner heat pumps need not comply with Section A5.207.1.2 Under performance method of compliance, the resulting increase in energy use due to elimination of the setback thermostat shall be factored into the compliance analysis in accordance with a method prescribed by the Executive Director.

A5.207.1.4 Gas- and oil-fired furnace standby loss controls. Gas-fired and oil-fired forced air furnaces with input ratings ≥ 225,000 Btu/h shall also have an intermittent ignition or interrupted device (IID) and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for furnaces where combustion air is drawn from the conditioned space. All furnaces with input ratings ≥ 225,000 Btu/h, including electric furnaces, that are not located within the conditioned space shall have jacket losses not exceeding 0.75 percent of the input rating.

TABLE A5.207.1-A
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	EFFICIENCY[1]		TEST PROCEDURE
		Before 1/1/2010	After 1/1/2010	
Air conditioners, Air cooled	≥ 65,000 Btu/h and < 135,000 Btu/h	10.3 EER[2]	11.2 EER[2]	ARI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	9.7 EER[2]	11.0 EER[2]	ARI 340/360
	≥ 240,000 Btu/h and < 760,000 Btu/h	9.5 EER[2] and 9.7 IPLV[2]	10.0 EER[2] and 9.7 IPLV[2]	
	≥ 760,000 Btu/h	9.2 EER[2] and 9.4 IPLV[2]	9.7 EER[2] and 9.4 IPLV[2]	
Air conditioners, water and evaporatively cooled				ARI 210/240
	> 240,000 Btu/h	11.0 EER[2] and 10.3 IPLV[2]		ARI 340/360
Condensing Units, Air Cooled	≥ 135,000 Btu/h	10.1 EER and 11.2 IPLV		ARI 365
Condensing units, water or evaporatively cooled	≥ 135,000 Btu/h	13.1 EER and 13.1 IPLV		

1. IPLVs are only applicable to equipment with capacity modulation.
2. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE A5.207.1-B
UNITARY AND APPLIED HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	EFFICIENCY[1]		TEST PROCEDURE
			Before 1/1/2010	After 1/1/2010	
Air cooled (cooling mode)	≥ 65,000 Btu/h and < 135,000 Btu/h	Split system and single package	10.1 EER[2]	11.0	ARI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h		9.3 EER[2]	10.6	
	≥ 240,000 Btu/h		9.0 EER[2] and 9.2 IPLV[2]	9.5 EER[2] and 9.2 IPLV[2]	
Air cooled (heating mode)	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	3.2 COP	3.3 COP	ARI 210/240
	≥ 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	3.1 COP	3.2 COP	ARI 340/360

1. IPLVs and Part load rating conditions are applicable only to equipment with capacity modulation.
2. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE A5.207.1-C
AIR-COOLED GAS-ENGINE HEAT PUMPS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	EFFICIENCY	TEST PROCEDURE
Air-cooled gas engine heat pump (cooling mode)	All capacities	95°F db Outdoor air	0.60 COP	ANSI Z21.40.4
Air-cooled gas engine heat pump (heating mode)	All capacities	47°F db/43°F wb Outdoor air	0.72 COP	ANSI Z21.40.4

TABLE A5.207.1-D
WATER CHILLING PACKAGES—MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	EFFICIENCY	TEST PROCEDURE
Air cooled, with condenser	< 150 Tons	2.80 COP	ARI 550/590
Electrically operated	≥ 150 Tons	3.05 IPLV	
Air cooled, without condenser	All Capacities	3.10 COP	
Electrically operated		3.45 IPLV	
Water cooled, electrically operated, positive displacement	All Capacities	4.20 COP	ARI 550/590
(Reciprocating)		5.05 IPLV	
Water cooled, Electrically operated, Positive displacement	< 150 Tons	4.45 COP	ARI 550/590
		5.20 IPLV	
	≥ 150 Tons and < 300 Tons	4.90 COP	
		5.60 IPLV	
	≥ 300 Tons	5.50 COP	
(Rotary screw and scroll)		6.15 IPLV	
Water cooled, electrically operated, centrifugal	< 150 Tons	5.00 COP	ARI 550/590
		5.25 IPLV	
	≥ 150 Tons and < 300 Tons	5.55 COP	
		5.90 IPLV	
	≥ 300 Tons	6.10 COP	
		6.40 IPLV	
Air cooled absorption, single effect	All Capacities	0.60 COP	ARI 560
Water cooled absorption, single effect	All Capacities	0.70 COP	
Absorption double effect, indirect-fired	All Capacities	1.00 COP 1.05 IPLV	
Absorption double effect, direct-fired	All Capacities	1.00 COP	
		1.00 IPLV	
Water cooled gas engine driven chiller	All Capacities	1.2 COP 2.0 IPLV	ANSI Z21.40.4

TABLE A5.207.1-E
PACKAGED TERMINAL AIR CONDITIONERS AND PACKAGED TERMINAL HEAT PUMPS – MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY (Input)	SUBCATEGORY OR RATING CONDITION	EFFICIENCY[1]	TEST PROCEDURE
PTAC (cooling mode) new construction	All Capacities	95°F db outdoor air	12.5 – (0.213 × Cap/1000)[1] EER	ARI 310/380
PTAC (cooling mode) replacements[2]			10.9 – (0.213 × Cap/1000)[1] EER	
PTHP (cooling mode) new construction			12.3 – (0.213 × Cap/1000)[1] EER	
PTHP (cooling mode) replacements[2]			10.8 – (0.213 × Cap/1000)[1] EER	
PTHP (heating mode) new construction			3.2 – (0.026 × Cap/1000)[1] COP	
PTHP (heating mode) replacements[2]			2.9 – (0.026 × Cap/1000)[1] COP	
SPVAC (cooling mode)	< 65,000 Btu/h	95°F db/75°F wb outdoor air	9.0 EER	ARI 390
	> = 65,000 Btu/h and < 135,000 Btu/h		8.9 EER	
	> =135,000 Btu/h and < 240,000 Btu/h		8.6 EER	
SPVHP (cooling mode)	< 65,000 Btu/h		9.0 EER	
	> = 65,000 Btu/h and < 135,000 Btu/h		8.9 EER	
	> =135,000 Btu/h and < 240,000 Btu/h		8.6 EER	
SPVHP (heating mode)	< 65,000 Btu/h	47°F db/43°F wb outdoor air	3.0 COP	
	> = 65,000 Btu/h and < 135,000 Btu/h		3.0 COP	
	> =135,000 Btu/h and < 240,000 Btu/h		2.9 COP	

1. Cap means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7,000 Btu/h, use 7,000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.
2. Replacement units must be factory labeled as follows: MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS. Replacement efficiencies apply only to units with existing sleeves less than 16 inches high and less than 42 inches wide.

TABLE A5.207.1-G
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT[4]

EQUIPMENT TYPE	TOTAL SYSTEM HEAT REJECTION CAPACITY AT RATED CONDITIONS	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED[1,2]	TEST PROCEDURE[3]
Propeller or axial fan open cooling towers	All	95°F entering water	≥ 38.2 gpm/hp	CTI ATC-105
		85°F leaving water		and
		75°F wb outdoor air		CTI STD-201
Centrifugal fan open cooling towers	All	95°F entering water	≥ 20.0 gpm/hp	CTI ATC-105
		85°F leaving water		and
		75°F wb outdoor air		CTI STD-201
Air cooled condensers	All	125°F condensing temperature	≥ 176,000 Btu/h·hp	ARI 460
		R22 test fluid		
		190°F entering gas temperature		
		15°F subcooling		
		95°F entering drybulb		

1. For purposes of this table, open cooling tower performance is defined as the maximum flow rating of the tower divided by the fan nameplate rated motor power.
2. For purposes of this table air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.
3. Open cooling towers shall be tested using the test procedures in CTI ATC-105. Performance of factory assembled open cooling towers shall be either certified as base models as specified in CTI STD-201 or verified by testing in the field by a CTI approved testing agency. Open factory assembled cooling towers with custom options added to a CTI certified base model for the purpose of safe maintenance or to reduce environmental or noise impact shall be rated at 90 percent of the CTI certified performance of the associated base model or at the manufacturer's stated performance, whichever is less. Base models of open factory assembled cooling towers are open cooling towers configured in exact accordance with the Data of Record submitted to CTI as specified by CTI STD-201. There are no certification requirements for field erected cooling towers.
4. The efficiencies for open cooling towers listed in Table A5.207.1-G are not applicable for closed-circuit cooling towers.

TABLE A5.207.1-H
COPS FOR NONSTANDARD CENTRIFUGAL CHILLERS < 150 TONS

CENTRIFUGAL CHILLERS < 150 Tons COP_{std} = 5.0								
			CONDENSER FLOW RATE					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	LIFT[1] (°F)	Required COP					
46	75	29	5.58	5.83	6.03	6.32	6.54	6.70
45	75	30	5.50	5.74	5.92	6.19	6.38	6.53
44	75	31	5.42	5.65	5.82	6.07	6.24	6.37
43	75	32	5.35	5.57	5.72	5.95	6.11	6.23
42	75	33	5.27	5.49	5.64	5.85	6.00	6.11
41	75	34	5.19	5.41	5.56	5.75	5.89	5.99
46	80	34	5.19	5.41	5.56	5.75	5.89	5.99
40	75	35	5.11	5.33	5.48	5.67	5.79	5.88
45	80	35	5.11	5.33	5.48	5.67	5.79	5.88
44	80	36	5.03	5.26	5.40	5.58	5.70	5.79
43	80	37	4.94	5.18	5.32	5.50	5.62	5.70
42	80	38	4.84	5.10	5.25	5.43	5.53	5.61
41	80	39	4.73	5.01	5.17	5.35	5.46	5.53
46	85	39	4.73	5.01	5.17	5.35	5.46	5.53
40	80	40	4.62	4.92	5.09	5.27	5.38	5.45
45	85	40	4.62	4.92	5.09	5.27	5.38	5.45
44	85	41	4.49	4.82	5.00	5.20	5.30	5.38
43	85	42	4.35	4.71	4.91	5.12	5.23	5.30
42	85	43	4.19	4.59	4.81	5.03	5.15	5.22
41	85	44	4.02	4.46	4.70	4.94	5.06	5.14
40	85	45	3.84	4.32	4.58	4.84	4.98	5.06
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)

$K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$

where $\times$ = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

TABLE A5.207.1-I
COPS FOR NONSTANDARD CENTRIFUGAL CHILLERS > 150 TONS, ≤ 300 TONS

CENTRIFUGAL CHILLERS > 150 Tons, < 300 Tons COP_{std} = 5.55								
			CONDENSER FLOW RATE					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	LIFT[1] (°F)	Required COP					
46	75	29	6.17	6.44	6.66	6.99	7.23	7.40
45	75	30	6.08	6.34	6.54	6.84	7.06	7.22
44	75	31	6.00	6.24	6.43	6.71	6.9	7.05
43	75	32	5.91	6.15	6.33	6.58	6.76	6.89
42	75	33	5.83	6.07	6.23	6.47	6.63	6.75
41	75	34	5.74	5.98	6.14	6.36	6.51	6.62
46	80	34	5.74	5.98	6.14	6.36	6.51	6.62
40	75	35	5.65	5.90	6.05	6.26	6.40	6.51
45	80	35	5.65	5.90	6.05	6.26	6.40	6.51
44	80	36	5.56	5.81	5.97	6.17	6.30	6.40
43	80	37	5.46	5.73	5.89	6.08	6.21	6.30
42	80	38	5.35	5.64	5.80	6.00	6.12	6.20
41	80	39	5.23	5.54	5.71	5.91	6.03	6.11
46	85	39	5.23	5.54	5.71	5.91	6.03	6.11
40	80	40	5.10	5.44	5.62	5.83	5.95	6.03
45	85	40	5.10	5.44	5.62	5.83	5.95	6.03
44	85	41	4.96	5.33	5.55	5.74	5.86	5.94
43	85	42	4.81	5.21	5.42	5.66	5.78	5.86
42	85	43	4.63	5.08	5.31	5.56	5.69	5.77
41	85	44	4.45	4.93	5.19	5.46	5.60	5.69
40	85	45	4.24	4.77	5.06	5.35	5.50	5.59
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)

$K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$

where $\times$ = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

TABLE A5.207.1-J
COPS FOR NONSTANDARD CENTRIFUGAL CHILLERS > 300 TONS

CENTRIFUGAL CHILLERS > 300 TONS COP_{std} = 6.1								
			CONDENSER FLOW RATE					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperture (°F)	LIFT[1] (°F)	Required COP					
46	75	29	6.80	7.11	7.35	7.71	7.97	8.16
45	75	30	6.71	6.99	7.21	7.55	7.78	7.96
44	75	31	6.61	6.89	7.09	7.40	7.61	7.77
43	75	32	6.52	6.79	6.98	7.26	7.45	7.60
42	75	33	6.43	6.69	6.87	7.13	7.31	7.44
41	75	34	6.33	6.60	6.77	7.02	7.18	7.30
46	80	34	6.33	6.60	6.77	7.02	7.18	7.30
40	75	35	6.23	6.50	6.68	6.91	7.06	7.17
45	80	35	6.23	6.50	6.68	6.91	7.06	7.17
44	80	36	6.13	6.41	6.58	6.81	6.95	7.05
43	80	37	6.02	6.31	6.49	6.71	6.85	6.94
42	80	38	5.90	6.21	6.40	6.61	6.75	6.84
41	80	39	5.77	6.11	6.30	6.52	6.65	6.74
46	85	39	5.77	6.11	6.30	6.52	6.65	6.74
40	80	40	5.63	6.00	6.20	6.43	6.56	6.65
45	85	40	5.63	6.00	6.20	6.43	6.56	6.65
44	85	41	5.47	5.87	6.10	6.33	6.47	6.55
43	85	42	5.30	5.74	5.98	6.24	6.37	6.46
42	85	43	5.11	5.60	5.86	6.13	6.28	6.37
41	85	44	4.90	5.44	5.72	6.02	6.17	6.27
40	85	45	4.68	5.26	5.58	5.90	6.07	6.17
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)
   $K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$
   where $\times$ = Condenser DT + LIFT
   $COP_{adj} = K_{adj} * COP_{std}$

TABLE A5.207.1-K
IPLV/NPLV FOR NONSTANDARD CENTRIFUGAL CHILLERS < 150 TONS

CENTRIFUGAL CHILLERS < 150 Tons $IPLV_{std}$ = 5.25								
			Condenser Flow Rate					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	LIFT[1] (°F)	Required IPLV/NPLV					
46	75	29	5.84	6.10	6.30	6.61	6.84	7.00
45	75	30	5.75	6.00	6.19	6.47	6.68	6.83
44	75	31	5.67	5.91	6.08	6.34	6.53	6.67
43	75	32	5.59	5.82	5.99	6.23	6.39	6.52
42	75	33	5.51	5.74	5.90	6.12	6.27	6.39
41	75	34	5.43	5.66	5.81	6.02	6.16	6.26
46	80	34	5.43	5.66	5.81	6.02	6.16	6.26
40	75	35	5.35	5.58	5.73	5.93	6.06	6.15
45	80	35	5.35	5.58	5.73	5.93	6.06	6.15
44	80	36	5.26	5.50	5.65	5.84	5.96	6.05
43	80	37	5.16	5.42	5.57	5.76	5.87	5.96
42	80	38	5.06	5.33	5.49	5.67	5.79	5.87
41	80	39	4.95	5.24	5.41	5.60	5.71	5.78
46	85	39	4.95	5.24	5.41	5.60	5.71	5.78
40	80	40	4.83	5.14	5.32	5.52	5.63	5.70
45	85	40	4.83	5.14	5.32	5.52	5.63	5.70
44	85	41	4.69	5.04	5.25[3]	5.43	5.55	5.62
43	85	42	4.55	4.93	5.13	5.35	5.47	5.54
42	85	43	4.38	4.80	5.03	5.26	5.38	5.46
41	85	44	4.21	4.67	4.91	5.17	5.30	5.38
40	85	45	4.01	4.52	4.79	5.06	5.20	5.29
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)
3. All values shown are NPLV except at conditions of 3 gpm/ton and °F LIFT which is IPLV.

$K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$

where $\times$ = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

TABLE A5.207.1-L
IPLV/NPLV FOR NONSTANDARD CENTRIFUGAL CHILLERS > 150 TONS, < 300 TONS

CENTRIFUGAL CHILLERS > 150 TONS, < 300 TONS $IPLV_{std}$ = 5.9								
			Condenser Flow Rate					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	LIFT[1] (°F)	Required IPLV/NPLV					
46	75	29	6.58	6.87	7.11	7.46	7.71	7.90
45	75	30	6.49	6.76	6.98	7.30	7.53	7.70
44	75	31	6.40	6.66	6.86	7.15	7.36	7.52
43	75	32	6.31	6.56	6.75	7.02	7.21	7.35
42	75	33	6.22	6.47	6.65	6.90	7.07	7.20
41	75	34	6.13	6.38	6.55	6.79	6.95	7.06
46	80	34	6.13	6.38	6.55	6.79	6.95	7.06
40	75	35	6.03	6.29	6.46	6.68	6.83	6.94
45	80	35	6.03	6.29	6.46	6.68	6.83	6.94
44	80	36	5.93	6.20	6.37	6.58	6.72	6.82
43	80	37	5.82	6.11	6.28	6.49	6.62	6.72
42	80	38	5.71	6.01	6.19	6.40	6.53	6.62
41	80	39	5.58	5.91	6.10	6.31	6.44	6.52
46	85	39	5.58	5.91	6.10	6.31	6.44	6.52
40	80	40	5.44	5.80	6.00	6.22	6.35	6.43
45	85	40	5.44	5.80	6.00	6.22	6.35	6.43
44	85	41	5.29	5.68	5.90[3]	6.13	6.26	6.34
43	85	42	5.13	5.55	5.79	6.03	6.16	6.25
42	85	43	4.94	5.41	5.67	5.93	6.07	6.16
41	85	44	4.74	5.26	5.54	5.82	5.97	6.07
40	85	45	4.52	5.09	5.40	5.71	5.87	5.97
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)
3. All values shown are NPLV except at conditions of 3 gpm/ton and °F LIFT which is IPLV.

$K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$

where $\times$ = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

TABLE A5.207.1-M
IPLV/NPLV FOR NONSTANDARD CENTRIFUGAL CHILLERS > 300 TONS

CENTRIFUGAL CHILLERS > 300 TONS $IPLV_{std}$ = 6.4								
			CONDENSER FLOW RATE					
			2 gpm/ton	2.5 gpm/ton	3 gpm/ton	4 gpm/ton	5 gpm/ton	6 gpm/ton
Leaving Chilled Water Temperature (°F)	Entering Condenser Water Temperature (°F)	LIFT[1] (°F)	Required IPLV/NPLV					
46	75	29	7.15	7.47	7.72	8.10	8.37	8.58
45	75	30	7.05	7.35	7.58	7.93	8.18	8.36
44	75	31	6.95	7.23	7.45	7.77	8.00	8.16
43	75	32	6.85	7.13	7.33	7.63	7.83	7.98
42	75	33	6.75	7.03	7.22	7.49	7.68	7.82
41	75	34	6.65	6.93	7.12	7.37	7.55	7.67
46	80	34	6.65	6.93	7.12	7.37	7.55	7.67
40	75	35	6.55	6.83	7.01	7.26	7.42	7.54
45	80	35	6.55	6.83	7.01	7.26	7.42	7.54
44	80	36	6.44	6.73	6.92	7.15	7.30	7.41
43	80	37	6.32	6.63	6.82	7.05	7.19	7.30
42	80	38	6.20	6.53	6.72	6.95	7.09	7.19
41	80	39	6.06	6.42	6.62	6.85	6.99	7.08
46	85	39	6.06	6.42	6.62	6.85	6.99	7.08
40	80	40	5.91	6.30	6.52	6.76	6.89	6.98
45	85	40	5.91	6.30	6.52	6.76	6.89	6.98
44	85	41	5.75	6.17	6.40[3]	6.66	6.79	6.89
43	85	42	5.57	6.03	6.28	6.55	6.70	6.79
42	85	43	5.37	5.88	6.16	6.44	6.59	6.69
41	85	44	5.15	5.71	6.01	6.33	6.49	6.59
40	85	45	4.91	5.53	5.86	6.20	6.37	6.48
Condenser DT[2]			14.04	11.23	9.36	7.02	5.62	4.68

1. LIFT = Entering Condenser Water Temperature (°F) – Leaving Chilled Water Temperature (°F)
2. Condenser DT = Leaving Condenser Water Temperature (°F) – Entering Condenser Water Temperature (°F)
3. All values shown are NPLV except at conditions of 3 gpm/ton and °F LIFT which is IPLV.

$K_{adj} = 6.1507 - 0.30244(\times) + 0.0062692(\times)^2 - 0.000045595(\times)^3$

where $\times$ = Condenser DT + LIFT

$COP_{adj} = K_{adj} * COP_{std}$

A5.207.2 Space conditioning systems. A building complies with this section by being designed with and having constructed and installed a space-conditioning system that meets the requirements of Subsections A5.207.2.1 through A5.207.2.6.

A5.207.2.1 Supply-air temperature reset controls. Mechanical space-conditioning systems supplying heated or cooled air to multiple zones shall include controls that automatically reset supply-air temperatures:

1. In response to representative building loads or to outdoor air temperature; and
2. By at least 25 percent of the difference between the design supply-air temperature and the design room air temperature.

Air distribution systems serving zones that are likely to have constant loads, such as interior zones, shall be designed for the air flows resulting from the fully reset supply-air temperature.

Exceptions:

1. Systems that meet the requirements of Section 144(d) of Title 24, Part 6, without using Exception 1 or 2 to that section.
2. Where supply-air temperature reset would increase overall building energy use.
3. Zones in which specific humidity levels are required to satisfy process needs.

A5.207.2.2 Electric resistance heating. Electric resistance heating systems shall not be used for space heating.

Exceptions:

1. Where an electric-resistance heating system supplements a heating system in which at least 60 percent of the annual energy requirement is supplied by site-solar or recovered energy.
2. Where the total capacity of all electric-resistance heating systems serving the entire building is less than 10 percent of the total design output capacity of all heating equipment serving the entire building.
3. Where an electric resistance heating system serves an entire building that is not a high-rise residential or hotel/motel building; and has a conditioned floor area no greater than 5,000 square feet; and has no mechanical cooling; and is in an area where natural gas is not currently available and an extension of a natural gas system is impractical, as determined by the natural gas utility.

A5.207.2.3 Heat rejection systems.

A5.207.2.3.1 General. Subsection A5.207.2.3 applies to heat rejection equipment used in comfort cooling systems such as air-cooled condensers, open cooling towers, closed-circuit cooling towers and evaporative condensers.

A5.207.2.3.2 Fan speed control. Each fan powered by a motor of 7.5 hp (5.6 kW) or larger shall have the capability to operate that fan at $^2/_3$ of full speed or less and shall have controls that automatically change the fan speed to control the leaving fluid temperature or condensing temperature/pressure of the heat rejection device.

Exceptions:

1. Heat rejection devices included as an integral part of the equipment listed in Tables A5.207.1-A through A5.207.1-E.
2. Condenser fans serving multiple refrigerant circuits.
3. Condenser fans serving flooded condensers.
4. Up to $^1/_3$ of the fans on a condenser or tower with multiple fans where the lead fans comply with the speed control requirement.

A5.207.2.3.3 Tower flow turndown. Open cooling towers configured with multiple condenser water pumps shall be designed so that all cells can be run in parallel with the larger of:

1. The flow that's produced by the smallest pump or
2. 33 percent of the design flow for the cell.

A5.207.2.3.4 Limitation on centrifugal fan cooling towers. Open cooling towers with a combined rated capacity of 900 gpm and greater at 95°F condenser water return, 85°F condenser water supply and 75°F outdoor wet-bulb temperature shall use propeller fans and shall not use centrifugal fans.

Exceptions:

1. Cooling towers that are ducted (inlet or discharge) or have an external sound trap that requires external static pressure capability.
2. Cooling towers that meet the energy efficiency requirement for propeller fan towers in Section A5.207.1, Table A5.207.1-G.

A5.207.2.4 Hydronic system measures.

A5.207.2.4.1 Hydronic variable flow systems. HVAC chilled and hot water pumping shall be designed for variable fluid flow and shall be capable of reducing pump flow rates to no more than the larger of: a) 50 percent or less of the design flow rate; or b) the minimum flow required by the equipment manufacturer for the proper operation of equipment served by the system.

Exceptions:

1. Systems that include no more than three control valves.
2. Systems having a total pump system power less than or equal to $1^1/_2$ HP.

A5.207.2.4.2 Chiller isolation. When a chilled water plant includes more than one chiller, provisions shall be made so that flow through any chiller is automatically shut off when that chiller is shut off while still maintaining flow through other operating chiller(s). Chillers that are piped in series for the purpose of increased temperature differential shall be considered as one chiller.

A5.207.2.4.3 Boiler isolation. When a hot water plant includes more than one boiler, provisions shall be made so that flow through any boiler is automatically shut off when that boiler is shut off while still maintaining flow through other operating boiler(s).

A5.207.2.4.4 Chilled and hot water temperature reset controls. Chilled and hot water systems with a design capacity exceeding 500,000 Btu/hr supplying chilled or heated water (or both) shall include controls that automatically reset supply water temperatures as a function of representative building loads or outside air temperature.

Exception: Hydronic systems that use variable flow to reduce pumping energy in accordance with Section A5.207.2.4.1.

A5.207.2.4.5 Water-cooled air conditioner and hydronic heat pump systems. Water circulation systems serving water-cooled air conditioners, hydronic heat pumps or both that have total pump system power exceeding 5 hp shall have flow controls that meet the requirements of Section A5.207.2.4.6. Each air conditioner or heat pump shall have a two-position automatic valve interlocked to shut off water flow when the compressor is off.

A5.207.2.4.6 Variable flow controls.

A5.207.2.4.6.1 Variable speed drives. Individual pumps serving variable flow systems and having a motor horsepower exceeding 5 hp shall have controls and/or devices (such as variable speed control) that will result in pump motor demand of no more than 30 percent of design wattage at 50 percent of design water flow. The pumps shall be controlled as a function of required differential pressure.

A5.207.2.4.6.2 Pressure sensor location and setpoint.

1. For systems without direct digital control of individual coils reporting to the central control panel, differential pressure shall be measured at or near the most remote heat exchanger or the heat exchanger requiring the greatest differential pressure.
2. For systems with direct digital control of individual coils with central control panel, the static pressure set point shall be reset based on the valve requiring the most pressure and the setpoint shall be no less than 80 percent open. The pressure sensor(s) may be mounted anywhere.

Exceptions:

1. Heating hot water systems.
2. Condenser water systems serving only water-cooled chillers.

A5.207.2.4.7 Hydronic heat pump (WLHP) controls. Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection and heat addition shall have controls that are capable of providing a heat pump water supply temperature dead band of at least 20°F between initiation of heat rejection and heat addition by the central devices.

Exception: Where a system loop temperature optimization controller is used to determine the most efficient operating temperature based on real-time conditions of demand and capacity, dead bands of less than 20°F shall be allowed.

A5.207.2.5 Air distribution system duct leakage sealing. All duct systems shall be sealed to a leakage rate not to exceed 6 percent of the fan flow if the duct system:

A5.207.2.5.1 Is connected to a constant volume, single zone, air conditioners, heat pumps or furnaces; and

A5.207.2.5.2 Serves less than 5,000 square feet of floor area; and

A5.207.2.5.3 Has more than 25 percent duct surface area located in one or more of the following spaces:

1. Outdoors; or
2. In a space directly under a roof where the *U*-factor of the roof is greater than the *U*-factor of the ceiling; or

   Exception: Where the roof meets the requirements of Section 143(a)1C of Title 24, Part 6.
3. In a space directly under a roof with fixed vents or openings to the outside or unconditioned spaces; or
4. In an unconditioned crawlspace; or
5. In other unconditioned spaces.

The leakage rate shall be confirmed through field verification and diagnostic testing, in accordance with procedures set forth in the Reference Nonresidential Appendix NA1 of the California Energy Commission 2008 *Building Energy Efficiency Standards for Residential and Nonresidential Buildings*.

A5.207.2.6 Variable air volume control for single zone systems. Effective January 1, 2012, all unitary air conditioning equipment and air-handling units with mechanical cooling capacity at ARI conditions greater than or equal to 110,000 Btu/hr that serve single zones shall be designed for variable supply air volume with their supply fans controlled by two-speed motors, variable speed drives or equipment that has been demonstrated to the Executive Director to use no more energy. The supply fan controls shall modulate down to a minimum of $^2/_3$ of the full fan speed or lower at low cooling demand.

A5.207.3 Service water-heating systems and equipment.

A5.207.3.1 Certification by manufacturers. Any service water-heating system or equipment may be installed only if the manufacturer has certified that the system or equipment complies with all of the requirements of this subsection for that system or equipment.

A5.207.3.1.1 Temperature controls for service water-heating systems. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest

acceptable temperature settings for the intended use as listed in Table 2, Chapter 9 of the ASHRAE Handbook, HVAC Applications Volume.

A5.207.3.2 Efficiency. Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations as required by Section A5.210.1, subject to the following:

1. If more than one standard is listed in the Appliance Efficiency Regulations, the equipment shall meet all the standards listed; and
2. If more than one test method is listed in the Appliance Efficiency Regulations, the equipment shall comply with the applicable standard when tested with each test method; and
3. Where equipment can serve more than one function, such as both heating and cooling or both space heating and water heating, it shall comply with all the requirements applicable to each function; and
4. Where a requirement is for equipment rated at its "maximum rated capacity" or "minimum rated capacity," the capacity shall be as provided for and allowed by the controls, during steady-state operation.

A5.207.3.3 Installation. Any service water-heating system or equipment may be installed only if the system or equipment complies with all of the applicable requirements of this subsection for the system or equipment.

A5.207.3.3.1 Outlet temperature controls. On systems that have a total capacity greater than 167,000 Btu/hr, outlets that require higher than service water temperatures as listed in the ASHRAE Handbook, Applications Volume, shall have separate remote heaters, heat exchangers or boosters to supply the outlet with the higher temperature.

A5.207.3.3.2 Temperature controls for public lavatories. The controls shall limit the outlet temperature to 110°F.

A5.207.3.3.3 Insulation. Unfired service water heater storage tanks and backup tanks for solar water-heating systems shall have:

1. External insulation with an installed *R*-value of at least R-12; or
2. Internal and external insulation with a combined *R*-value of at least R-16; or
3. The heat loss of the tank surface based on an 80°F water-air temperature difference shall be less than 6.5 Btu per hour per square foot.

A5.207.3.3.4 Service water heaters in state buildings. Any newly constructed building constructed by the State shall derive its service water heating from a system that provides at least 60 percent of the energy needed for service water heating from site solar energy or recovered energy.

Exception: Buildings for which the state architect determines that service water heating from site solar energy or recovered energy is economically or physically infeasible.

A5.207.4 Natural gas central furnaces, cooking equipment and pool and spa heaters: Pilot lights prohibited.

Any natural gas system or equipment listed below may be installed only if it does not have a continuously burning pilot light:

1. Fan-type central furnaces
2. Household cooking appliances

   Exception: Household cooking appliances without an electrical supply voltage connection and in which each pilot consumes less than 150 Btu/hr
3. Pool heaters
4. Spa heaters

A5.207.5 Controls for space-conditioning systems. Space-conditioning systems shall be installed with controls that comply with the applicable requirements of Subsections A5.207.5.1 through A5.207.5.5.

A5.207.5.1 Thermostatic controls for each zone. The supply of heating and cooling energy to each space-conditioning zone or dwelling unit shall be controlled by an individual thermostatic control that responds to temperature within the zone and that meets the applicable requirements of Section A5.207.5.2.

Exception: An independent perimeter heating or cooling system may serve more than one zone without individual thermostatic controls if:

1. All zones are also served by an interior cooling system;
2. The perimeter system is designed solely to offset envelope heat losses or gains;
3. The perimeter system has at least one thermostatic control for each building orientation of 50 feet or more; and
4. The perimeter system is controlled by at least one thermostat located in one of the zones served by the system.

A5.207.5.2 Criteria for zonal thermostatic controls. The individual thermostatic controls required by Section A5.207.5.1 shall meet the following requirements as applicable:

1. Where used to control comfort heating, the thermostatic controls shall be capable of being set, locally or remotely, down to 55°F or lower.
2. Where used to control comfort cooling, the thermostatic controls shall be capable of being set, locally or remotely, up to 85°F or higher.
3. Where used to control both comfort heating and comfort cooling, the thermostatic controls shall meet Items 1 and 2 and shall be capable of providing a temperature range or dead band of at least 5°F within which the supply of heating and cooling energy to the zone is shut off or reduced to a minimum.

   Exception: Systems with thermostats that require manual changeover between heating and cooling modes.

4. Thermostatic controls for all unitary single zone, air conditioners, heat pumps and furnaces, shall comply with the setback thermostat requirements of Section A5.207.1.3 or, if equipped with DDC to the Zone level, with the Automatic Demand Shed Controls of Section A5.207.5.5.

   Exception: Systems serving zones that must have constant temperatures to prevent degradation of materials, a process, plants or animals.

A5.207.5.3 Heat pump controls. All heat pumps with supplementary electric resistance heaters shall be installed with controls that comply with Section A5.207.1.2.

A5.207.5.4 Dampers for air supply and exhaust equipment. Outdoor air supply and exhaust equipment shall be installed with dampers that automatically close upon fan shutdown.

Exceptions:

1. Where it can be demonstrated to the satisfaction of the enforcing agency that the equipment serves an area that must operate continuously.
2. Gravity and other nonelectrical equipment that has readily accessible manual damper controls.
3. At combustion air intakes and shaft vents.
4. Where prohibited by other provisions of law.

A5.207.5.5 Automatic demand shed controls. HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for noncritical zones as follows:

1. The controls shall have a capability to remotely setup the operating cooling temperature set points by 4 degrees or more in all noncritical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS).
2. The controls shall remotely set down the operating heating temperature set points by 4 degrees or more in all noncritical zones on signal from a centralized contact or software point within an EMCS.
3. The controls shall have capabilities to remotely reset the temperatures in all noncritical zones to original operating levels on signal from a centralized contact or software point within an EMCS.
4. The controls shall be programmed to provide an adjustable rate of change for the temperature setup and reset.

A5.207.6 Pipe insulation. The piping for all space-conditioning and service water-heating systems with fluid temperatures listed in Table A5.207.6-A shall have the amount of insulation specified in Subsection A5.207.6.1 or A5.207.6.2. Insulation conductivity shall be determined in accordance with ASTM C 335 at the mean temperature listed in Table A5.207.6-A and shall be rounded to the nearest $^1/_{100}$ Btu-inch per hour per square foot per °F.

Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance and wind, including but not limited to, the following:

Insulation exposed to weather shall be suitable for outdoor service, e.g., protected by aluminum, sheet metal, painted canvas or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

Insulation covering chilled water piping and refrigerant suction piping located outside the conditioned space shall include a vapor retardant located outside the insulation (unless the insulation is inherently vapor retardant), all penetrations and joints of which shall be sealed.

Exceptions:

1. Factory-installed piping within space-conditioning equipment certified under Section A5.210.1 or A5.207.1.
2. Piping that conveys fluids with a design operating temperature range between 60°F and 105°F.
3. Piping that serves process loads, gas piping, cold domestic water piping, condensate drains, roof drains, vents or waste piping.
4. Where the heat gain or heat loss to or from piping without insulation will not increase building source energy use.
5. Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration. Metal piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing.

A5.207.6.1 For insulation with a conductivity in the range shown in Table A5.207.6-A for the applicable fluid temperature range, the insulation shall have the applicable thickness shown in Table A5.207.6-A.

A5.207.6.2 For insulation with a conductivity outside the range shown in Table A5.207.6-A for the applicable fluid temperature range, the insulation shall have a minimum thickness as calculated with Equation A5.207.6-A below.

EQUATION A5.207.6-A
INSULATION THICKNESS EQUATION

$$T = PR\left[\left(1+\frac{t}{PR}\right)^{\frac{K}{k}} - 1\right]$$

where:

T = Minimum insulation thickness for material with conductivity K, inches.

PR = Pipe actual outside radius, inches.

t = Insulation thickness from Table A5.207.6-A, inches.

K = Conductivity of alternate material at the mean rating temperature indicated in Table A5.207.6-A, for the applicable fluid temperature range, in Btu-inch per hour per square foot per °F.

k = The lower value of the conductivity range listed in Table A5.207.6-A, for the applicable fluid temperature range, Btu-inch per hour per square foot per °F.

TABLE A5.207.6-A
PIPE INSULATION THICKNESS

FLUID TEMPERATURE RANGE (°F)	CONDUCTIVITY RANGE (in Btu-inch per hour per square foot per °F)	INSULATION MEAN RATING TEMPERATURE (°F)	NOMINAL PIPE DIAMETER (in inches)					
			Runouts up to 2	1 and less	1.25-2	2.50-4	5-6	8 and larger
			INSULATION THICKNESS REQUIRED (in inches)					
Space heating systems (steam, steam condensate and hot water)								
Above 350	0.32-0.34	250	1.5	2.5	2.5	3.0	3.5	3.5
251-350	0.29-0.31	200	1.5	2.0	2.5	2.5	3.5	3.5
201-250	0.27-0.30	150	1.0	1.5	1.5	2.0	2.0	3.5
141-200	0.25-0.29	125	0.5	1.5	1.5	1.5	1.5	1.5
105-140	0.24-0.28	100	0.5	1.0	1.0	1.0	1.5	1.5
Service water-heating systems (recirculating sections, all piping in electric trace tape systems and the first 8 feet of piping from the storage tank for nonrecirculating systems)								
Above 105	0.24-0.28	100	0.5	1.0	1.0	1.5	1.5	1.5
Space cooling systems (chilled water, refrigerant and brine)								
40-60	0.23-0.27	75	0.5	0.5	0.5	1.0	1.0	1.0
Below 40	0.23-0.27	75	1.0	1.0	1.5	1.5	1.5	1.5

A5.209
LIGHTING

A5.209.1 Lighting control devices, ballasts and luminaires. Any lighting control device, ballast or luminaire subject to the requirements of Section A5.209 shall be installed only if the manufacturer has certified to the Commission that the device complies with all of the applicable requirements of Section A5.209.

Lighting control devices may be individual devices or systems consisting of two or more components. For control systems consisting of two or more components, such as an Energy Management Control System (EMCS), the manufacturer of the control system shall certify each of the components required for the system to comply with Section A5.209.

A5.209.1.1 All devices: Instructions for installation and calibration. The manufacturer shall provide step-by-step instructions for installation and start-up calibration of the device.

A5.209.1.2 Indicator lights. Indicator lights integral to lighting control devices shall consume no more than one watt of power per indicator light.

A5.209.1.3 Automatic time switch control devices. Automatic time switch control devices or system shall:

1. Be capable of programming different schedules for weekdays and weekends; and
2. Have program backup capabilities that prevent the loss of the device's schedules for at least 7 days and the device's time and date setting for at least 72 hours if power is interrupted.

A5.209.1.4 Occupant sensors, motion sensors and vacancy sensors. Occupant sensors, motion sensors and vacancy sensors shall be capable of automatically turning off all the lights in an area no more than 30 minutes after the area has been vacated and shall have a visible status signal that indicates that the device is operating properly or that it has failed or malfunctioned. The visible status signal may have an override switch that turns the signal off. In addition, ultrasonic and microwave devices shall have a built-in mechanism that allows calibration of the sensitivity of the device to room movement in order to reduce the false sensing of occupants and shall comply with either Subsection A5.209.1.4.1 or A5.209.1.4.2 below, as applicable:

A5.209.1.4.1 If the device emits ultrasonic radiation as a signal for sensing occupants within an area, the device shall:

1. Have had a Radiation Safety Abbreviated Report submitted to the Center for Devices and Radiological Health, Federal Food and Drug Administration, under 21 Code of Federal Regulations, Section 1002.12 (1996) and a copy of the report shall have been submitted to the California Energy Commission; and
2. Emit no audible sound; and
3. Not emit ultrasound in excess of the decibel (dB) values shown in Table A5.209.1-A, measured no more than 5 feet from the source, on axis.

A5.209.1.4.2 If the device emits microwave radiation as a signal for sensing occupants within the area, the device shall:

1. Comply with all applicable provisions in 47 *Code of Federal Regulations*, Parts 2 and 15 (1996) and have an approved Federal Communications Commission Identifier that appears on all units of the device and that has been submitted to the California Energy Commission; and
2. Not emit radiation in excess of 1 milliwatt per square centimeter measured at no more than 5 centimeters from the emission surface of the device; and
3. Have permanently affixed to it installation instructions recommending that it be installed at least 12 inches from any area normally used by room occupants.

A5.209.1.5 Multilevel occupant sensor. Multilevel occupant sensors shall have an automatic OFF function that turns off all the lights and either an automatic or a manually controlled ON function capable of meeting all the multilevel and uniformity requirements of Section A5.209.2.2 for the controlled lighting. The first stage shall be capable of activating between 30–70 percent of the lighting power in a room either through an automatic or manual action and may be a switching or dimming system. After that event occurs the device shall be capable of all of the following actions when manually called to do so by the occupant:

1. Activating the alternate set of lights
2. Activating 100 percent of the lighting power
3. Deactivating all lights

A5.209.1.6 Automatic daylighting control devices. Automatic daylighting control devices used to control lights in daylit zones shall:

1. Be capable of reducing the power consumption of the general lighting in the controlled area by at least two thirds in response to the availability of daylight; and
2. If the device is a dimmer controlling incandescent or fluorescent lamps, provide electrical outputs to lamps for reduced flicker operation through the dimming range, so that the light output has an amplitude modulation of less than 30 percent for frequencies less than 200 Hz and without causing premature lamp failure; and
3. If the devices reduce lighting in control steps, incorporate time-delay circuits to prevent cycling of light level changes of less than 3 minutes and have a manual or automatic means of adjusting the deadband to provide separation of on and off points for each control step; and
4. If the device is placed in calibration mode, automatically restore its time delay settings to normal operation programmed time delays after no more than 60 minutes; and
5. Have a setpoint control that easily distinguishes settings to within 10 percent of full scale adjustment; and
6. Have a light sensor that has a linear response with 5 percent accuracy over the range of illuminance measured by the light sensor; and
7. Have a light sensor that is physically separated from where calibration adjustments are made or is capable of being calibrated in a manner that the person initiating calibration is remote from the sensor during calibration to avoid influencing calibration accuracy.

A5.209.1.7 Interior photosensors. Interior photosensor shall not have a mechanical slide cover or other device that permits easy unauthorized disabling of the control and shall not be incorporated into a wall-mounted occupant-sensor.

A5.209.1.8 Multilevel astronomical time-switch controls. Multilevel astronomical time-switch controls used to control lighting in daylit zones shall:

1. Contain at least two separately programmable steps per zone that reduces illuminance in a relatively uniform manner as specified in Section A5.209.2.2; and
2. Have a separate offset control for each step of 1 to 240 minutes; and
3. Have sunrise and sunset prediction accuracy within +/- 15 minutes and timekeeping accuracy within 5 minutes per year; and
4. Store astronomical time parameters (used to develop longitude, latitude, time zone) for at least 7 days if power is interrupted; and
5. Display date/time, sunrise and sunset and switching times for each step; and
6. Have an automatic daylight savings time adjustment; and
7. Have automatic time switch capabilities specified in Section A6.209.1.3.

A5.209.1.9 Outdoor astronomical time-switch controls. Outdoor astronomical time-switch controls used to control outdoor lighting as specified in Section A5.209.3.3 shall:

1. Contain at least two separately programmable steps per function area; and
2. Have the ability to independently offset the on and off times for each channel by 0 to 99 minutes before or after sunrise or sunset; and
3. Have sunrise and sunset prediction accuracy within +/- 15 minutes and timekeeping accuracy within 5 minutes per year; and
4. Store astronomical time parameters (used to develop longitude, latitude, time zone) for at least 7 days if power is interrupted; and
5. Display date/time, sunrise and sunset; and
6. Have an automatic daylight savings time adjustment; and
7. Have automatic time switch capabilities specified in Section A5.209.1.3.

A5.209.1.10 Dimmers. Dimmers used to control lighting shall:

1. Be capable of reducing power consumption by a minimum of 65 percent when the dimmer is at its lowest light level; and
2. If the device is a dimmer controlling incandescent or fluorescent lamps, provide electrical outputs to lamps for reduced flicker operation through the dimming range, so that the light output has an amplitude modulation of less than 30 percent for frequencies less than 200 Hz and without causing premature lamp failure; and
3. Be listed by a rating lab recognized by the International Code Council (ICC) as being in compliance with Underwriters Laboratories Standards; and
4. If the device is a wall box dimmer designed to be used in a three- or more-way circuit with nondimmable switches, the level set by the dimmer, shall not be overridden by any of the switches in the circuit. The dimmer and all of the switches in the circuit shall have the capability of turning lighting OFF if it is ON and turning lighting ON to the level set by the dimmer if the lighting is OFF. Any wall box dimmer that is connected to a system with an emergency override function shall be controlled by the emergency override.
5. If the device is a stepped dimmer, it shall include an off position to turn lights completely off.

TABLE A5.209.1-A
ULTRASOUND MAXIMUM DECIBEL VALUES

MIDFREQUENCY OF SOUND PRESSURE THIRD-OCTAVE BAND (in kHz)	MAXIMUM dB LEVEL WITHIN THIRD-OCTAVE BAND (in dB reference 20 micropascals)
Less than 20	80
20 or more to less than 25	105
25 or more to less than 31.5	110
31.5 or more	115

A5.209.2 Indoor lighting controls

A5.209.2.1 Area controls.

A5.209.2.1.1 Each area enclosed by ceiling-height partitions shall have an independent switching or control device. This switching or control device shall be:

1. Readily accessible; and
2. Located so that a person using the device can see the lights or area controlled by that switch or so that the area being lit is annunciated; and
3. Manually operated or automatically controlled by an occupant-sensor that meets the applicable requirements of Section A5.209.1.

A5.209.2.1.2 Other devices may be installed in conjunction with the switching or control device provided that they:

1. Permit the switching or control device to manually turn the lights off in each area enclosed by ceiling-height partitions; and
2. Reset the mode of any automatic system to normal operation without further action.

Exception 1 to Section A5.209.2.1: Up to 0.3 watts per square foot of lighting in any area within a building that must be continuously illuminated for reasons of building security or emergency egress, if:

1. The area is designated a security or emergency egress area on the plans and specifications submitted to the enforcement agency under Section 10-103(a)2 of Title 24, Part 1; and
2. The security or egress lighting is controlled by switches accessible only to authorized personnel.

Exception 2 to Section A5.209.2.1: Public areas with switches that are accessible only to authorized personnel.

A5.209.2.2 Multilevel lighting controls. The general lighting of any enclosed space 100 square feet or larger and has a connected lighting load that exceeds 0.8 watts per square foot, shall have multilevel lighting controls. Multilevel controls shall have at least one control step that is between 30 percent and 70 percent of design lighting power and allow the power of all lights to be manually turned off. A reasonably uniform level of illuminance shall be achieved by any of the following:

1. Continuous or stepped dimming of all lamps or luminaires; or
2. Switching alternate lamps in luminaires, alternate luminaires and alternate rows of luminaires.

Exceptions:

1. Lights in corridors
2. A space that has only one luminaire with no more than two lamps

A5.209.2.3 Daylight areas.

A5.209.2.3.1 Daylight areas shall be defined as follows:

A5.209.2.3.1.1 Daylight area. The total daylight area shall not double count overlapping areas with any primary sidelit daylight area, secondary sidelit daylight area or skylit daylight area.

A5.209.2.3.1.2 Daylight area, primary sidelit is the combined primary sidelit area without double counting overlapping areas. The floor area for each primary sidelit area is directly adjacent to vertical glazing below the ceiling with an area equal to the product of the sidelit width and the primary sidelit depth.

The primary sidelit width is the width of the window plus, on each side, the smallest of:

1. 2 feet; or
2. The distance to any 5 feet or higher permanent vertical obstruction.

The primary sidelit depth is the horizontal distance perpendicular to the glazing which is the smaller of:

1. One window head height; or
2. The distance to any 5 feet or higher permanent vertical obstruction.

A5.209.2.3.1.3 Daylight area, secondary sidelit is the combined secondary sidelit area without double counting overlapping areas. The floor area for each secondary sidelit area is directly adjacent to primary sidelit area with an area equal to the product of the sidelit width and the secondary sidelit depth.

The secondary sidelit width is the width of the window plus, on each side, the smallest of:

1. 2 feet; or
2. The distance to any 5 feet or higher permanent vertical obstruction; or
3. The distance to any skylit daylight area.

The secondary sidelit depth is the horizontal distance perpendicular to the glazing which begins from one window head height and ends at the smaller of:

1. Two window head heights;
2. The distance to any 5 feet or higher permanent vertical obstruction; or
3. The distance to any skylit daylight area.

A5.209.2.3.1.4 Daylight area, skylit is the combined daylight area under each skylight without double counting overlapping areas. The daylight area under each skylight is bounded by the rough opening of the skylight, plus horizontally in each direction the smallest of:

1. 70 percent of the floor-to-ceiling height; or
2. The distance to any primary sidelit area or the daylight area under rooftop monitors; or
3. The distance to any permanent partition or permanent rack which is farther away than 70 percent of the distance between the top of the permanent partition or permanent rack and the ceiling.

A5.209.2.3.2 Luminaires providing general lighting that are in or are partially in the skylit daylight area and/or the primary sidelit daylight area shall be controlled as follows:

A5.209.2.3.2.1 Primary sidelit and skylit daylight areas shall have at least one lighting control that:

1. Controls at least 50 percent of the general lighting power in the primary sidelit and skylit daylight areas separately from other lighting in the enclosed space.
2. Controls luminaires in primary sidelit areas separately from skylit areas.

Exception: Primary sidelit and skylit daylight areas that have a combined area totaling less than or equal to 250 square feet within any enclosed space.

A5.209.2.3.2.2 For all skylit daylight areas:

1. The skylit daylight area shall be shown on the plans.
2. All of the general lighting in the skylit area shall be controlled independently by an automatic daylighting control device that meets the applicable requirements of Section A5.209.1.
3. The automatic daylighting control shall be installed in accordance with Section A5.209.2.3.2.4.

Exceptions:

1. Where the total skylit daylight area in any enclosed space is less than or equal to 2,500 square feet.
2. Skylit daylight areas where existing adjacent structures obstruct direct beam sunlight for at least 6 hours per day during the equinox as calculated using computer or graphical methods.
3. When the skylight effective aperture is greater than 4.0 percent and all general lighting in the skylit area is controlled by a multilevel astronomical time switch that meets the requirements of Section A5.209.1.8 and that has an override switch that meets the requirements of Section A5.209.2.4.2.
4. Skylit daylight areas where the effective aperture is less than 0.006. The effective aperture for skylit daylight areas is specified in Section 146(a)2E of Title 24, Part 6.

A5.209.2.3.2.3 The primary sidelit area(s) shall be shown on the plans and the general lighting in the primary sidelit areas shall be controlled independently by an automatic daylighting control device that meets the applicable requirements of Section A5.209.1 and is installed in accordance with Section A5.209.2.3.2.4.

Exceptions:

1. Where the total primary sidelit daylight area in any enclosed space has an area less than or equal to 2,500 square feet.
2. Primary sidelit daylight areas where the effective aperture is less than 0.1. The effective aperture for primary sidelit daylight areas is specified in Section 146(a)2E of Title 24, Part 6.
3. Primary sidelit daylight areas where existing adjacent structures are twice as tall as their distance away from the windows.
4. Parking garages.

A5.209.2.3.2.4 Automatic daylighting control device installation and operation. Automatic daylighting control devices shall be installed and configured to operate according to all of the following requirements:

1. Automatic daylighting control devices shall have photosensors that are located so that they are not readily accessible in accordance with the designer's or manufacturer's instructions.
2. The location where calibration adjustments are made to the automatic daylighting control device shall be readily accessible to authorized personnel or located within 2 feet of a ceiling access panel that is no higher than 11 feet above floor level.
3. Automatic daylighting controls shall be multilevel, including continuous dimming and have at least one control step that is between 50 percent to 70 percent of rated power of the controlled lighting.

   Exceptions:

   1. Controlled lighting having a lighting power density less than 0.3 W/ft^2.
   2. When skylights are replaced or added to on an existing building with an existing general lighting system.
4. Under all daylight conditions in all areas served by the controlled lighting, the combined illuminance from the controlled lighting and daylight is not less than the illuminance from controlled lighting when no daylight is available.
5. When all areas served by the controlled lighting are receiving daylight illuminance levels greater than 150 percent of the illuminance from controlled lighting when no daylight is available, the controlled lighting power consumption shall be no greater than 35 percent of the rated power of the controlled lighting.

A5.209.2.4 Shut-off controls.

A5.209.2.4.1 In addition to the manual controls installed to comply with Sections A5.209.2.1 and A5.209.2.2 for every floor, all indoor lighting systems shall be equipped with separate automatic controls to shut off the lighting. These automatic controls shall meet the requirements of Section A5.209.1and may be an occupant sensor, automatic time switch or other device capable of automatically shutting off the lighting.

Exceptions:

1. Where the lighting system is serving an area that must be continuously lit, 24 hours per day/365 days per year.
2. Lighting in corridors, guestrooms, dwelling units of high-rise residential buildings and hotel/motels and parking garages.
3. Up to 0.3 watts per square foot of lighting in any area within a building that must be continuously illuminated for reasons of building security or emergency egress, provided that the area is designated a security or emergency egress area on the plans and specifications submitted to the enforcement agency under Section 10-103(a)2 of Title 24, Part 1.

A5.209.2.4.2 If an automatic control device is installed to comply with Section A5.209.2.4.1, it shall incorporate an override switching device that:

1. Is readily accessible; and
2. Is located so that a person using the device can see the lights or the area controlled by that switch or so that the area being lit is annunciated; and
3. Is manually operated; and
4. Allows the lighting to remain on for no more than 2 hours when an override is initiated; and

   Exception: In malls, auditoriums, single tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time may exceed 2 hours.
5. Controls an area enclosed by ceiling height partitions not exceeding 5,000 square feet.

   Exception: In malls, auditoriums, single tenant retail spaces, industrial facilities, convention centers and arenas, the area controlled may not exceed 20,000 square feet.

A5.209.2.4.3 If an automatic time switch control device is installed to comply with Section A5.209.2.4.1, it shall incorporate an automatic holiday "shut-off" feature that turns off all loads for at least 24 hours and then resumes the normally scheduled operation.

Exception: Retail stores and associated malls, restaurants, grocery stores, churches and theaters.

A5.209.2.4.4 Offices 250 square feet or smaller; multipurpose rooms of less than 1,000 square feet and classrooms and conference rooms of any size, shall be equipped with occupant sensor(s) to shut off the lighting. In addition, controls shall be provided that allow the lights to be manually shut off in accordance with Section A5.209.2.1 regardless of the sensor status.

A5.209.3 Outdoor lighting controls and equipment.

A5.209.3.1 Outdoor lighting. All permanently installed outdoor luminaires employing lamps rated over 100 watts shall either have a lamp efficacy of at least 60 lumens per watt or be controlled by a motion sensor.

Exceptions:

1. Lighting required by a health or life safety statute ordinance or regulation, including but not limited to, emergency lighting.
2. Lighting used in or around swimming pools, water features or other locations subject to Article 680 of Title 24, Part 3, *California Electrical Code*.

3. Searchlights
4. Theme lighting for use in theme parks
5. Lighting for film or live performances
6. Temporary outdoor lighting
7. Light emitting diode, light emitting capacitors, neon and cold cathode lighting
8. Sign lighting

A5.209.3.2 Luminaire cutoff requirements. All outdoor luminaires that use lamps rated greater than 175 watts in hardscape areas including parking lots, building entrances, sales and nonsales canopies and all outdoor sales areas shall be designated Cutoff for light distribution. To comply with this requirement, the luminaire shall be rated Cutoff in a photometric test report that includes any tilt or other nonlevel mounting condition of the installed luminaire. Cutoff is a luminaire light distribution classification where the candela per 1000 lamp lumens does not numerically exceed 25 at or above a vertical angle of 90 degrees above nadir and 100 at or above a vertical angle of 80 degrees above nadir. Nadir is in the direction of straight down, as would be indicated by a plumb line. 90 degrees above nadir is horizontal. 80 degrees above nadir is 10 degrees below horizontal.

Exceptions:

1. Signs
2. Lighting for building facades, public monuments, statues and vertical surfaces of bridges
3. Lighting required by a health or life safety statute ordinance or regulation, including but not limited to, emergency lighting
4. Temporary outdoor lighting
5. Lighting used in or around swimming pools, water features or other locations subject to Article 680 of the *California Electrical Code*
6. Replacement of existing pole mounted luminaires in hardscape areas meeting all of the following conditions:
    1. Where the existing luminaire does not meet the luminaire cutoff requirements in A5.209.3.2; and
    2. Spacing between existing poles is greater than 6 times the mounting height of the existing luminaires; and
    3. Where no additional poles are being added to the site; and
    4. Where new wiring to the luminaires is not being installed; and
    5. Provided that the connected lighting power wattage is not increased.

A5.209.3.3 Controls for outdoor lighting.

A5.209.3.3.1 All permanently installed outdoor lighting shall be controlled by a photocontrol or astronomical time switch that automatically turns off the outdoor lighting when daylight is available.

Exception: Lighting in tunnels and large covered areas that require illumination during daylight hours.

A5.209.3.3.2 For lighting of building facades, parking lots, sales and nonsales canopies, all outdoor sales areas and student pick-up/drop-off zones where two or more luminaires are used, an automatic time switch shall be installed that is capable of (1) turning off the lighting when not needed and (2) reducing the lighting power (in watts) by at least 50 percent but not exceeding 80 percent or providing continuous dimming through a range that includes 50 percent through 80 percent reduction. This control shall meet the requirements of Section A5.209.1.3.

Exceptions:

1. Lighting required by a health or life safety statute ordinance or regulation, including but not limited to, emergency lighting
2. Lighting for steps or stairs that require illumination during daylight hours
3. Lighting that is controlled by a motion sensor and photocontrol
4. Lighting for facilities that have equal lighting requirements at all hours and are designed to operate continuously
5. Temporary outdoor lighting
6. Signs

A5.209.4 Outdoor lighting. This section applies to all outdoor lighting, whether attached to buildings, poles, structures or self-supporting, including but not limited to, hardscape areas including parking lots, lighting for building entrances, sales and nonsales canopies; lighting for all outdoor sales areas; and lighting for building facades.

Exceptions: When more than 50 percent of the light from a luminaire falls on one or more of the following applications, the lighting power for that luminaire shall be exempt from Section A5.209.4.2.

1. Temporary outdoor lighting
2. Lighting required and regulated by the Federal Aviation Administration and the Coast Guard
3. Lighting for public streets, roadways, highways and traffic signage lighting, including lighting for driveway entrances occurring in the public right-of-way
4. Lighting for sports and athletic fields and children's playground
5. Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and marinas, chemical and petroleum processing plants and aviation facilities
6. Lighting specifically for automated teller machines as required by *California Financial Code* Section 13040 or required by law through a local ordinance
7. Lighting of public monuments

8. Signs shall meet the requirements of Section A5.209.5
9. Lighting used in or around swimming pools, water features or other locations subject to Article 680 of Title 24, Part 3, *California Electrical Code*
10. Lighting of tunnels, bridges, stairs, wheelchair elevator lifts for American with Disabilities Act (ADA) compliance and ramps that are other than parking garage ramps
11. Landscape lighting
12. In theme parks: outdoor lighting for themes and special effects
13. Lighting for outdoor theatrical and other outdoor live performances, provided that these lighting systems are additions to area lighting systems and are controlled by a multiscene or theatrical cross-fade control station accessible only to authorized operators
14. Outdoor lighting systems for qualified historic buildings, as defined in Title 24, Part 8, *California Historic Building Code*, if they consist solely of historic lighting components or replicas of historic lighting components. If lighting systems for qualified historic buildings contain some historic lighting components or replicas of historic components, combined with other lighting components, only those historic or historic replica components are exempt. All other outdoor lighting systems for qualified historic buildings shall comply with Section A5.209.4

A.5.209.4.1 Outdoor lighting power trade-offs. Outdoor lighting power trade-offs shall be determined as follows:

1. Allowed lighting power determined according to Section A5.209.4.4.1 for general hardscape lighting allowance may be traded to specific applications in Section A5.209.4.4.2, provided the hardscape area from which the lighting power is traded continues to be illuminated in accordance with Section A5.209.4.4.1.1.
2. Allowed lighting power determined according to Section A5.209.4.4.2 for additional lighting power allowances for specific applications shall not be traded between specific applications or to hardscape lighting in Section A5.209.4.4.1.
3. Allowed lighting power determined according to Section A5.209.4.4.3 for additional lighting power allowances for local ordinance shall not be traded to specific applications in Section A5.209.4.4.2 or to hardscape areas not covered by the local ordinance.
4. Trading off lighting power allowances between outdoor and indoor areas shall not be permitted.

A5.209.4.2 Outdoor lighting power. An outdoor lighting installation complies with this section if the actual outdoor lighting power installed is no greater than the allowed outdoor lighting power calculated under Section A5.209.4.4 The allowed outdoor lighting shall be calculated by Lighting Zone as defined in Section 10-114 of Title 24, Part 1. Local governments may amend lighting zones in compliance with Section 10-114 of Title 24, Part 1.

A5.209.4.3 Calculation of actual lighting power. The wattage of outdoor luminaires shall be determined in accordance with Section 130(d) of Title 24, Part 6.

A5.209.4.4 Calculation of allowed lighting power. The allowed lighting power shall be the combined total of the sum of the general hardscape lighting allowance determined in accordance with Section A5.209.4.4.1, the sum of the additional lighting power allowance for specific applications determined in accordance with Section A5.209.4.4.2 and the sum of the additional lighting power allowances for local ordinance determined in accordance with Section A5.209.4.4.3.

A5.209.4.4.1 General hardscape lighting allowance. Determine the general hardscape lighting power allowances as follows:

A5.209.4.4.1.1 The general hardscape area of a site shall include parking lot(s), roadway(s), driveway(s), sidewalk(s), walkway(s), bikeway(s), plaza(s) and other improved area(s) that are illuminated. In plan view of the site, determine the illuminated hardscape area, which is defined as any hardscape area that is within a square pattern around each luminaire or pole that is ten times the luminaire mounting height with the luminaire in the middle of the pattern, less any areas that are within a building, beyond the hardscape area, beyond property lines or obstructed by a structure. The illuminated hardscape area shall include portions of planters and landscaped areas that are within the lighting application and are less than or equal to 10 feet wide in the short dimensions and are enclosed by hardscape or other improvement on at least three sides. Multiply the illuminated hardscape area by the Area Wattage Allowance (AWA) from Table A5.209.4-A for the appropriate Lighting Zone.

A5.209.4.4.1.2 Determine the perimeter length of the general hardscape area. The total perimeter shall not include portions of hardscape that is not illuminated according to Section A5.209.4.4.1.1 Multiply the hardscape perimeter by the Linear Wattage Allowance (LWA) for hardscape from Table A5.209.4-A for the appropriate lighting zone. The perimeter length for hardscape around landscaped areas and permanent planters shall be determined as follows:

1. Landscaped areas completely enclosed within the hardscape area and which have width or length less than 10 feet wide, shall not be added to the hardscape perimeter length.
2. Landscaped areas completely enclosed within the hardscape area and which width or length are a minimum of 10 feet wide, the perimeter of the landscaped areas or permanent planter shall be added to the hardscape perimeter length.

3. Landscaped edges that are not abutting the hardscape shall not be added to the hardscape perimeter length.

A5.209.4.4.1.3 Determine the Initial Wattage Allowance (IWA) for general hardscape lighting from Table A.209.4-A for the appropriate lighting zone. The hardscape area shall be permitted one IWA per site.

A5.209.4.4.1.4 The general hardscape lighting allowance shall be the sum of the allowed watts determined from Sections A5.209.4.4.1.1, A5.209.4.4.1.2 and A5.209.4.4.1.3 above.

A5.209.4.4.2 Additional lighting power allowance for specific applications. Additional lighting power for specific applications shall be the smaller of the additional lighting allowances for specific applications determined in accordance with Table A5.209.4-B for the appropriate lighting zone or the actual installed lighting power meeting the requirements for the allowance.

A5.209.4.4.3 Additional lighting power allowance for local ordinance requirements. For hardscape areas, including parking lots, site roadways, driveways, sidewalks, walkways or bikeways, when specific light levels are required by law through a local ordinance and provided the local ordinance meets Section 10-114 of Title 24, Part 1, additional lighting power for those hardscape areas covered by the local ordinance requirement shall be the smaller of the additional lighting allowances for local ordinance determined from Table A5.209.4-C for the appropriate lighting zone or the actual installed lighting power meeting the requirements for the allowance.

TABLE A5.209.4-A
GENERAL HARDSCAPE LIGHTING POWER ALLOWANCE

TYPE OF POWER ALLOWANCE	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
Area wattage allowance (AWA)	0.036 W/ft^2	0.045 W/ft^2	0.092 W/ft^2	0.115 W/ft^2
Linear wattage allowance (LWA)	0.36 W/lf	0.45 W/lf	0.92 W/lf	1.15 W/lf
Initial wattage allowance (IWA)	340 W	510 W	770 W	1030 W

TABLE A5.209.4-B
ADDITIONAL LIGHTING POWER ALLOWANCE FOR SPECIFIC APPLICATIONS
All area and distance measurements in plan view unless otherwise noted.

	LIGHTING APPLICATION	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
WATTAGE ALLOWANCE PER APPLICATION. Use all that apply as appropriate.					
	Building entrances or exits. Allowance per door. Luminaires qualifying for this allowance shall be within 20 feet of the door.	30 watts	75 watts	100 watts	120 watts
	Primary entrances to senior care facilities, police stations, hospitals, fire stations and emergency vehicle facilities. Allowance per primary entrance(s) only. Primary entrances shall provide access for the general public and shall not be used exclusively for staff or service personnel. This allowance shall be in addition to the building entrance or exit allowance above. Luminaires qualifying for this allowance shall be within 100 feet of the primary entrance.	45 watts	80 watts	120 watts	130 watts
	Drive up windows. Allowance per customer service location. Luminaires qualifying for this allowance shall be within two mounting heights of the sill of the window.	40 watts	75 watts	125 watts	200 watts
	Vehicle service station uncovered fuel dispenser. Allowance per fueling dispenser. Luminaires qualifying for this allowance shall be within two mounting heights of the dispenser.	120 watts	175 watts	185 watts	330 watts
WATTAGE ALLOWANCE PER UNIT LENGTH (w/linear ft). May be used for one or two frontage side(s) per site.					
	Outdoor sales frontage. Allowance for frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. Luminaires qualifying for this allowance shall be located between the principal viewing location and the frontage outdoor sales area.	No allowance	22.5 w/linear ft	36 w/linear ft	45 w/linear ft
WATTAGE ALLOWANCE PER HARDSCAPE AREA (W/ft^2). May be used for any illuminated hardscape area on the site.					
	Hardscape ornamental lighting. Allowance for the total site illuminated hardscape area. Luminaires qualifying for this allowance shall be rated for 100 watts or less as determined in accordance with Section 130(d) and shall be post-top luminaires, lanterns, pendant luminaires or chandeliers.	No allowance	0.02 w/ft^2	0.04 w/ft^2	0.06 w/ft^2
WATTAGE ALLOWANCE PER SPECIFIC AREA (W/ft^2). Use as appropriate provided that none of the following specific applications shall be used for the same area.					
	Building facades. Only areas of building façade that are illuminated shall qualify for this allowance. Luminaires qualifying for this allowance shall be aimed at the façade and shall be capable of illuminating it without obstruction or interference by permanent building features or other objects.	No allowance	0.18 w/ft^2	0.35 w/ft^2	0.50 w/ft^2
	Outdoor sales lots. Allowance for uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale. Driveways, parking lots or other nonsales areas shall be considered hardscape areas even if these areas are completely surrounded by sales lot on all sides. Luminaires qualifying for this allowance shall be within five mounting heights of the sales lot area.	0.164 w/ft^2	0.555 w/ft^2	0.758 w/ft^2	1.285 w/ft^2
	Vehicle service station hardscape. Allowance for the total illuminated hardscape area less area of buildings, under canopies, off property or obstructed by signs or structures. Luminaires qualifying for this allowance shall be illuminating the hardscape area and shall not be within a building, below a canopy, beyond property lines or obstructed by a sign or other structure.	0.014 w/ft^2	0.155 w/ft^2	0.308 w/ft^2	0.485 w/ft^2
	Vehicle service station canopies. Allowance for the total area within the drip line of the canopy. Luminaires qualifying for this allowance shall be located under the canopy.	0.514 w/ft^2	1.005 w/ft^2	1.358 w/ft^2	2.285 w/ft^2
	Sales canopies allowance for the total area within the drip line of the canopy. Luminaires qualifying for this allowance shall be located under the canopy.	No allowance	0.655 w/ft^2	0.908 w/ft^2	1.135 w/ft^2
	Nonsales canopies. Allowance for the total area within the drip line of the canopy. Luminaires qualifying for this allowance shall be located under the canopy.	0.084 w/ft^2	0.205 w/ft^2	0.408 w/ft^2	0.585 w/ft^2
	Guard stations. Allowance up to 1,000 square feet per vehicle lane. Guard stations provide access to secure areas controlled by security personnel who stop and may inspect vehicles and vehicle occupants, including identification, documentation, vehicle license plates and vehicle contents. Qualifying luminaires shall be within two mounting heights of a vehicle lane or the guardhouse.	0.154 w/ft^2	0.355 w/ft^2	0.708 w/ft^2	0.985 w/ft^2
	Student pick-up/drop-off zone. Allowance for the area of the student pick-up/drop-off zone, with or without canopy, for preschool through 12th grade school campuses. A student pick-up/drop off zone is a curbside, controlled traffic area on a school campus where students are picked up and dropped off from vehicles. The allowed area shall be the smaller of the actual width or 25 feet, times the smaller of the actual length or 250 feet. Qualifying luminaires shall be within two mounting heights of the student pick-up/drop-off zone.	No allowance	0.12 w/ft^2	0.45 w/ft^2	No allowance
	Outdoor dining. Allowance for the total illuminated hardscape of outdoor dining. Outdoor dining areas are hardscape areas used to serve and consume food and beverages. Qualifying luminaires shall be within 2 mounting heights of the hardscape area of outdoor dining.	0.014 w/ft^2	0.135 w/ft^2	0.258 w/ft^2	0.435 w/ft^2
	Special security lighting for retail parking and pedestrian hardscape. This additional allowance is for illuminated retail parking and pedestrian hardscape identified as having special security needs. This allowance shall be in addition to the building entrance or exit allowance.	0.007 w/ft^2	0.009 w/ft^2	0.019 w/ft^2	No allowance

TABLE A5.209.4-C
ADDITIONAL LIGHTING POWER ALLOWANCE FOR ORDINANCE REQUIREMENTS

ADDITIONAL LIGHTING POWER ALLOWANCE (W/ft^2) WHEN AVERAGE LIGHT LEVELS ARE REQUIRED BY LOCAL ORDINANCE.				
Required (horizontal foot-candles, AVERAGE)	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.5	0	0	0	0
1.0	0.004	0	0	0
1.5	0.024	0.015	0	0
2.0	0.044	0.035	0	0
3.0	0.084	0.075	0.028	0.005
4.0 or greater	0.124	0.115	0.068	0.045
ADDITIONAL LIGHTING POWER ALLOWANCE (W/ft^2) WHEN MINIMUM LIGHT LEVELS ARE REQUIRED BY LOCAL ORDINANCE.				
Required (horizontal foot-candles, MINIMUM)	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.5	0.004	0	0	0
1.0	0.044	0.035	0	0
1.5	0.124	0.115	0.068	0.045
2.0	0.164	0.155	0.108	0.085
3.0	0.164	0.155	0.108	0.085
4.0 or greater	0.164	0.155	0.108	0.085

A5.209.5 Signs. This section applies to all internally illuminated and externally illuminated signs, unfiltered light emitting diodes (LEDs) and unfiltered neon, both indoor and outdoor. Each sign shall comply with either Subsection A5.209.5.1 or A5.209.5.2, as applicable.

A5.209.5.1 Maximum allowed lighting power.

A5.209.5.1.1 For internally illuminated signs, the maximum allowed lighting power shall not exceed the product of the illuminated sign area and 12 watts per square foot. For double-faced signs, only the area of a single face shall be used to determine the allowed lighting power.

A5.209.5.1.2 For externally illuminated signs, the maximum allowed lighting power shall not exceed the product of the illuminated sign area and 2.3 watts per square foot. Only areas of an externally lighted sign that are illuminated without obstruction or interference, by one or more luminaires, shall be used.

A5.209.5.2 Alternate lighting sources. The sign shall comply if it is equipped only with one or more of the following light sources:

A5.209.5.2.1 High pressure sodium lamps; or

A5.209.5.2.2 Metal halide lamps that are:

1. Pulse start or ceramic served by a ballast that has a minimum efficiency of 88 percent or greater or
2. Pulse start that are 320 watts or smaller, are not 250 watt or 175 watt lamps and are served by a ballast that has a minimum efficiency of 80 percent.

Where ballast efficiency is the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005; or

A5.209.5.2.3 Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to the following:

1. A minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA; or
2. A minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater.

Where the ratio of the output wattage to the input wattage is at 100 percent tubing load; or

A5.209.5.2.4 Fluorescent lamps with a minimum color rendering index (CRI) of 80; or

A5.209.5.2.5 Light emitting diodes (LEDs) with a power supply having an efficiency of 80 percent or greater; or

Exception: Single voltage external power supplies that are designed to convert 120 volt AC input into lower voltage DC or AC output and have a nameplate output power less than or equal to 250 watts, shall comply with the applicable requirements of the *Appliance Efficiency Regulations*, Title 20.

A5.209.5.2.6 Compact fluorescent lamps that do not contain medium screw base sockets (E24/E26) ; or

A5.209.5.2.7 Electronic ballasts with a fundamental output frequency not less than 20 kHz;

Exception 1 to Section A5.209.5: Unfiltered incandescent lamps that are not part of an electronic message center (EMC), an internally illuminated sign or an externally illuminated sign.

Exception 2 to Section A5.209.5: Exit signs. Exit signs shall meet the requirements of the *Appliance Efficiency Regulations.*

Exception 3 to Section A5.209.5: Traffic Signs. Traffic signs shall meet the requirements of the *Appliance Efficiency Regulations.*

A5.209.6 Sign lighting controls. All signs with permanently connected lighting shall meet the requirements below:

1. Automatic time switch control. All signs with permanently connected lighting shall be controlled with an automatic time switch control that complies with the applicable requirements of Section A5.209.1.
2. Photocontrol or outdoor astronomical time switch control. All outdoor signs shall be controlled with a photocontrol or outdoor astronomical time switch control.

   Exception: Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.
3. Dimming. All outdoor signs shall be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

   Exceptions:

   1. Signs that are illuminated for less than 1 hour per day during daylight hours.
   2. Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.
   3. Metal halide, high pressure sodium, cold cathode and neon lamps used to illuminated signs or parts of signs.
   4. Demand Responsive Electronic Message Center Control. An Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal that is sent out by the local utility.
   5. EMCs required by a health or life safety statue ordinance or regulation, including but not limited to exit signs and traffic signs.

A5.209.7 Nonresidential lighting control acceptance. Before an occupancy permit is granted for a new building or space or a new lighting system serving a building, space or site is operated for normal use, all indoor and outdoor lighting controls serving the building, space or site shall be certified as meeting the Acceptance Requirements for Code Compliance. A Certificate of Acceptance shall be submitted to the enforcement agency under Section 10-103(a) of Title 24, Part 1, that:

1. Certifies that plans, specifications, installation certificates and operating and maintenance information meet the requirements of Title 24, Part 6.
2. Certifies that automatic daylighting controls meet the applicable requirements of Sections A5.209.1 and A5.209.2.3.2.4.
3. Certifies that when a multilevel astronomical time switch is used to meet Exception 3 to Section A5.209.2.3.2.2 all general lighting in the skylit area is controlled by a multilevel astronomical time switch that meets the applicable requirements of Section A5.209.1 and that has an override switch that meets the requirements of Section A209.2.4.2.
4. Certifies that lighting controls meet the requirements of Sections A5.209.2.1 through A5.209.2.3 and Title 24, Part 6, Sections 131(e) and (f) and 146(a)2, as applicable.
5. Certifies that automatic lighting controls meet the applicable requirements of Sections A5.209.1 and A5.209.2.4.
6. Certifies that occupant-sensors meet the applicable requirements of Sections A5.209.1 and A5.209.2.4.
7. Certified that outdoor lighting controls meet the applicable requirements of Sections A5.209.1 and A5.209.3.

SECTION A5.210
APPLIANCES

A5.210.1 Appliances regulated by the *Appliance Efficiency Regulations*. Any appliance for which there is a California standard established in the *Appliance Efficiency Regulations* may be installed only if the manufacturer has certified to the Commission, as specified in those regulations, that the appliance complies with the applicable standard for that appliance.

Note: For certified appliances, go to www.energy.ca.gov/appliances/database/.

SECTION A5.211
RENEWABLE ENERGY

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

A5.211.1.1 Documentation. Calculate renewal on-site energy costs savings as a percentage of estimated local utility rates for conventional fuel types. Factor in net-metering, if offered by local utility, on an annual basis.

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

Exceptions:

1. Existing buildings with one year of occupancy or greater shall use actual data of the annual electrical energy consumption of the facilities. Using the data logged for the facilities, calculate the site's annual electrical production and consumption ration by dividing the proposed annual renewable electrical energy production (kWh) by the actual annual electrical energy consumption (kWh).
2. The annual renewable electrical energy can be renewable energy produced off-site on a remote property owned by the applicant.

A5.211.1.2.1 35 percent grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 0.35.

A5.211.1.2.2 75 percent grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 0.75.

A5.211.1.2.3 Grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 1.

A5.211.3 Green power. Using a calculation method approved by the California Energy Commission, calculate the renewable on-site energy system to meet the requirements of Section 511.1, expressed in kW. Factor in net-metering, if offered by local utility, on an annual basis.

A5.211.4 Prewiring for future solar. Install conduit from the building roof or eave to a location within the building identified as suitable for future installation of a charge controller (regulator) and inverter.

A5.211.4.1 Off-grid prewiring for future solar. If battery storage is anticipated, conduit should run to a location within the building that is stable, weather-proof, insulated against very hot and very cold weather and isolated from occupied spaces.

SECTION A5.212
ELEVATORS, ESCALATORS AND OTHER EQUIPMENT

A5.212.1 Elevators and escalators. In buildings with more than one elevator or two escalators, provide controls to reduce the energy demand of elevators for part of the day and escalators to reduce speed when no traffic is detected. Document the controls in the project specifications and commissioning plan. [DSA-SS] In Public School and Community College buildings, locate stairs conveniently to encourage their use in lieu of elevators or escalators.

A5.212.1.1 Controls. Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6 and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, *California Building Code*.

SECTION A5.213
ENERGY EFFICIENT STEEL FRAMING

A5.213.1 Steel framing. Design steel framing for maximum energy efficiency. Techniques for avoiding thermal bridging in the envelope include:

1. Exterior rigid insulation;
2. Punching large holes in the stud web without affecting the structural integrity of the stud;
3. Spacing the studs as far as possible while maintaining the structural integrity of the structure; and
4. Detailed design of intersections of wall openings and building intersections of floors, walls and roofs.

CALIFORNIA GREEN BUILDING STANDARDS CODE – MATRIX ADOPTION TABLE
APPENDIX A5 – NONRESIDENTIAL VOLUNTARY MEASURES
DIVISION A5.3 – WATER EFFICIENCY AND CONSERVATION

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)	X																		
Adopt only those sections that are listed below							X												
Chapter/Section																			
A5.301.1							X												
A5.302.1 Definitions							X												
A5.302.1 HYDROZONE							X												
A5.302.1 MODEL WATER EFFICIENT LANDSCAPE ORDINANCE							X												
A5.302.1 PLANTS																			
Adaptive plants							X												
Invasive plants							X												
A5.302.1 POTABLE WATER							X												
A5.302.1 RECYCLED WATER							X												
A5.302.1 SUBMETER							X												
A5.303.2.3.1							X												
Table A5.303.2.2							X												
Table A5.303.2.3.1							X												
A5.303.3							X												
Table A5.303.3							X												
A5.304.1.1	†						X												
A5.304.4.4	†						X												

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

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.3 – WATER EFFICIENCY AND CONSERVATION

SECTION A5.301
GENERAL

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

SECTION A5.302
DEFINITIONS

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

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

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

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

PLANTS.

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

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

Invasive plants. Invasive plants are both indigenous and 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.

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

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

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

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

SECTION A5.303
INDOOR WATER USE

A5.303.2.3.1 Tier 1 – 30 percent savings [DSA-SS] 30 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 30 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fittings as required by the *California Building Standards Code*. The 30 percent reduction in potable water use shall be demonstrated by one of the following methods:

1. Each plumbing fixture and fitting shall meet the 30 percent reduced flow rate specified in Table A5.303.2.3.1 or
2. A calculation demonstrating a 30 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

A5.303.2.3.2 Tier 2 – 35 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 35 percent shall be provided. A calculation demonstrating a 35 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

A5.303.2.3.3 40 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 40 percent shall be provided. A calculation demonstrating a 40 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided.

TABLE A5.303.2.2
WATER USE BASELINE[4]

FIXTURE TYPE	FLOW RATE[2]	DURATION	DAILY USES	OCCUPANTS[3]
Showerheads	2.5 gpm @ 80 psi	8 min.	1	X
Lavatory faucets residential	2.2 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	2.6 gpm @ 60 psi	4 min.	1	X
Replacement aerators	2.6 gpm @ 60 psi			X
Wash fountains	2.2 [rim space (in.)/20 gpm @ 60 psi]			X
Metering faucets	0.25 gallons/cycle	.25 min.	3	X
Metering faucets for wash fountains	.25 [rim space (in.)/20 gpm @ 60 psi]	.25 min.	1 male[1] 3 female	X
Gravity tank type water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer tank water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Flushometer valve water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Electromechanical hydraulic water closets	1.6 gallons/flush	1 flush	1 male[1] 3 female	X
Urinals	1.6 gallons/flush	1 flush	2 male	X

1. The daily use number shall be increased to three if urinals are not installed in the room.
2. The flow rate is from the CEC Appliance Efficiency Standards, Title 20, *California Code of Regulations*; where a conflict occurs, the CEC standards shall apply.
3. Refer to Table A, Chapter 4, 2007 *California Plumbing Code*, for occupant load factors.
4. Use worksheet WS-1 to calculate base line water use.

TABLE A5.303.2.3.1
FIXTURE FLOW RATES

FIXTURE TYPE	FLOW-RATE[2]	MAXIMUM FLOW RATE AT 30 percent REDUCTION
Showerheads	2.5 gpm @ 80 psi	1.8 gpm @ 80 psi
Lavatory faucets nonresidential	0.5 gpm @ 60 psi	0.35 gpm @ 60 psi
Kitchen faucets	2.2 gpm @ 60 psi	1.6 gpm @ 60 psi
Wash fountains	2.2 [rim space(in.)/20 gpm @ 60 psi]	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering faucets	0.25 gallons/cycle	0.18 gallons/cycle
Metering faucets for wash fountains	.25 [rim space(in.)/20 gpm @ 60 psi]	.18 [rim space(in.)/20 gpm @ 60 psi]
Gravity tank type water closets	1.6 gallons/flush	1.12 gallons/flush[1]
Flushometer tank water closets	1.6 gallons/flush	1.12 gallons/flush[1]
Flushometer valve water closets	1.6 gallons/flush	1.12 gallons/flush[1]
Electromechanical hydraulic water closets	1.6 gallons/flush	1.12 gallons/flush[1]
Urinals	1.0 gallons/flush	.5 gallons/flush

1. Includes water closets with an effective flush rate of 1.12 gallons or less when tested per ASME A 112.19.2 and ASME A 112.19.14.
2. See Table 5.503.2.3 for additional notes and references.

A5.303.3 Appliances.

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—5.8 gallons per cycle
   b. Commercial—refer to Table A5.303.3
3. Ice makers shall be air cooled.
4. Food steamers shall be connectionless or boilerless.
5. [BSC] The use and installation of water softeners that discharge to the community sewer system shall be limited or prohibited by local agencies if certain conditions are met.

TABLE A5.303.3
COMMERCIAL DISHWASHER WATER USE

TYPE	HIGH-TEMPERATURE—MAXIMUM GALLONS PER RACK	CHEMICAL—MAXIMUM GALLONS PER RACK
Conveyer	0.70	0.62
Door	0.95	1.16 [BSC] 2.26 [DSA-SS]
Undercounter	0.90	0.98

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

SECTION A5.304
OUTDOOR WATER USE

A5.304.1.1 Water budget. A water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.

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

A5.304.2.1 Outdoor potable water use. For new water service not subject to the provisions of *Water Code* Section 535, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas between 500 square feet and 1000 square feet (the level at which Section 5.304.2 applies).

A5.304.4 Potable water reduction. Provide water efficient landscape irrigation design that reduces the use of potable water beyond the initial requirements for plant installation and establishment in accordance with Section A5.304.4.1 or A5.304.4.2. Calculations for the reduction shall be based on the water budget developed pursuant to Section 5.304.1.

A5.304.4.1 Tier 1. Reduce the use of potable water to a quantity that does not exceed 60 percent of ETo times the landscape area.

A5.304.4.2 Tier 2. Reduce the use of potable water to a quantity that does not exceed 55 percent of ETo times the landscape area.

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

1. Plant coefficient
2. Irrigation efficiency and distribution uniformity
3. Use of captured rainwater
4. Use of recycled water
5. Water treated for irrigation purposes and conveyed by a water district or public entity
6. Use of graywater

A5.304.4.3 Verification of compliance. A calculation demonstrating the applicable potable water use reduction required by this section shall be provided.

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

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

1. Plant coefficient
2. Irrigation efficiency and distribution uniformity
3. Use of captured rainwater
4. Use of recycled water
5. Water treated for irrigation purposes and conveyed by a water district or public entity

A5.304.5 Potable water elimination. Provide a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment. Methods used to accomplish the requirements of this section must be designed to the requirements of the *California Building Standards Code* and shall include, but not be limited to, the following:

1. Plant coefficient
2. Irrigation efficiency and distribution uniformity
3. Use of captured rainwater
4. Use of recycled water
5. Water treated for irrigation purposes and conveyed by a water district or public entity
6. Use of graywater

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 A5.204.5.2 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 Appendix G, 2010 *California Plumbing Code*.

SECTION A5.305
WATER REUSE
(Reserved)

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	**X**						**X**	**X**	**X**		**X**								
Chapter/Section																			
A5.401.1	X						X												
A5.402.1 Definitions	X						X												
A5.402.1 BUILDING COMMISSIONING							X												
A5.402.1 EMBODIED ENERGY	X						X												
A5.402.1 LIFE CYCLE ASSESSMENT	X						X												
A5.402.1 OVE	X						X												
A5.402.1 POSTCONSUMER CONTENT	X						X												
A5.402.1 PRECONSUMER (or POSTINDUSTRIAL) CONTENT	X						X												
A5.402.1 RECYCLED CONTENT	X						X												
A5.402.1 RECYCLED CONTENT VALUE (RCV)	X						X												
A5.404	X						X												
A5.405	X																		
A5.405.4							X												
A5.405.4.2							X												
A5.405.5 and subsections	X																		
A5.406.1	X																		
A5.406.1.1	X						X												
A5.406.1.2	X																		
A5.406.1.3							X												
A5.407								X	X		X								
A5.408.3.1	X																		
A5.408.3.1 w/Exceptions							X												
A5.408.3.1.1	X																		
A5.408.5								X	X		X								
A5.408.6 w/Exceptions								X	X		X								
A5.408.7								X	X		X								
A5.409	X						X												
A5.410.3 and subsections							X												
A5.410.4 and subsections							X												
A5.410.6								X	X		X								

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY

SECTION A5.401
GENERAL

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

SECTION A5.402
DEFINITIONS

A5.402.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

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

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

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

OVE. Optimal Value Engineering, another term for advanced wood framing techniques.

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

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

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

RECYCLED CONTENT VALUE (RCV). Material cost multiplied by postconsumer content plus $^1/_2$ the preconsumer content or RCV = $ x (postconsumer content + $^1/_2$ preconsumer content).

SECTION A5.403
FOUNDATION SYSTEMS
(Reserved)

SECTION A5.404
EFFICIENT FRAMING TECHNIQUES

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

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

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

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

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

SECTION A5.405
MATERIAL SOURCES

A5.405.1 Regional materials. Compared to other products in a given product category, select building materials or products for permanent installation on the project that have been harvested or manufactured in California or within 500 miles of the project site.

1. For those materials locally manufactured, select materials manufactured using low embodied energy or those that will result in net energy savings over their useful life.
2. Regional materials shall make up at least 10 percent, based on cost, of total materials value.
3. If regional materials make up only part of a product, their values are calculated as percentages based on weight.

4. Provide documentation of the origin, net projected energy savings and value of regional materials.

A5.405.2 Bio-based materials. Select bio-based building materials and products made from solid wood, engineered wood, bamboo, wool, cotton, cork, straw, natural fibers, products made from crops (soy-based, corn-based) and other bio-based materials with at least 50 percent bio-based content.

A5.405.2.1 Certified wood. Certified wood is an important component of green building strategies and the California Building Standards Commission will continue to develop a standard through the next code cycle.

A5.405.2.2 Rapidly renewable materials. Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of total materials value, based on estimated cost.

A5.405.3 Reused materials. Use salvaged, refurbished, refinished or reused materials for a minimum of 5 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

Note: Sources of some reused materials can be found at http://ww.ciwmb.ca.gov/RCP/Product.asp?VW=CAT&CATID=257. See also Appendix A5, Division A5.1, Section A5.105.1 for on-site materials reuse.

A5.405.4 Recycled content, Tier 1 [DSA-SS] Recycled content. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

A5.405.4.1 Recycled content, Tier 2. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 15 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

A5.405.4.2 Determination of recycled content value (RCV). The recycled content of a material assembly shall be determined by weight and the fractional value of the weight is then multiplied by the total estimated cost of the material assembly.

Note: Sources and recycled content of some recycled materials can be found at CalRecycle.

A5.405.5 Cement and concrete. Use cement and concrete made with recycled products and complying with the following sections.

A5.405.5.1 Cement. Meet the following standards for cement:

1. Portland cement shall meet ASTM C 150, *Standard Specification for Portland Cement*
2. Blended cement shall meet ASTM C 595, Standard Specification for Blended Hydraulic Cement or ASTM C 1157, *Standard Performance Specification for Hydraulic Cement.*

A5.405.5.2 Concrete. Unless otherwise directed by the engineer, use concrete manufactured with cementitious materials in accordance with Sections A5.405.5.2.1 and A5.405.5.2.1.1, as approved by the enforcing agency.

A5.405.5.2.1 Supplementary cementitious materials (SCMs). Use concrete made with one or more of the following supplementary cementitious materials (SCMs):

1. Fly ash meeting ASTM C 618, *Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.*
2. Ultra-fine fly ash (UFFA) meeting ASTM C 618, *Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete and CalTrans Standard Specification, Section 90-2.01B.*
3. Metakaolin meeting ASTM C 618, *Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete* and CalTrans Standard Specification, Section 90-2.01B.
4. Natural pozzolan meeting ASTM C 618, *Specification for Coal Fly Ash* and Raw or Calcined Natural Pozzolan for Use in Concrete.
5. Slag cement (GGBFS) meeting ASTM C 989, *Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.*
6. Silica fume meeting ASTM C 1240, *Specification for Silica Fume Used in Cementitious Mixtures.*
7. Other materials with comparable or superior environmental benefits, as approved by the engineer and enforcing authority.

Note: CalTrans specifications for UFFA and metakaolin may be found in the 2009-09 updates to the 2006 CalTrans specifications.

A5.405.5.2.1.1 Mix design equation. Use any combination of one or more SCMs, satisfying the equation:

$$F/25 + SL/50 + UF/12 = 1 \qquad \textbf{Equation A5.4-1}$$

where:

F = Fly ash, natural pozzolan or other approved SCM, percent of total cementitious material for concrete on the project

SL = GGBFS, including the amount in blended cement percent of total cementitious material for concrete on the project

UF = Silica fume, metakaolin or UFFA, including the amount in blended cement, percent of total cementitious material for concrete on the project

Exception: Minimums for concrete products requiring high early strength may be lower as directed by the engineer.

A5.405.5.3 Additional means of compliance. Any of the following measures may be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with Section A5.405.5.2.

A5.405.5.3.1 Cement. The following measures may be used in the manufacture of cement.

A5.405.5.3.1.1 Alternative fuels. Where permitted by state or local air quality standards, use alternative fuels.

A5.405.5.3.1.2 Alternative power. Use alternate electric power generated at the cement plant and/or green power purchased from the utility meeting the requirements of Section A5.211.

A5.405.5.3.1.3 Alternative ingredients. Use inorganic processing additions and limestone meeting ASTM C 150, *Standard Specifications for Portland Cement.*

A5.405.5.3.2 Concrete. The following measures may be used in the manufacture of concrete,

A5.405.5.3.2.1 Alternative energy. Use renewable or alternative energy meeting the requirements of Section A5.211.

A5.405.5.3.2.2 Recycled aggregates. Use concrete made with one or more of the following materials:

1. Blast furnace slag as a lightweight aggregate in nonreinforced concrete.
2. Recycled concrete that meets grading requirements of ASTM C 33, *Standard Specification for Concrete Aggregates.*
3. Other materials with comparable or superior environmental benefits, as approved by the engineer and enforcing authority.

A5.405.5.3.2.3 Mixing water. Use water meeting ASTM C 1602, *Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete,* either recycled water provided by the local water purveyor or water reclaimed from manufacturing processes.

SECTION A5.406
ENHANCED DURABILITY AND REDUCED MAINTENANCE

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

A5.406.1.1 Service life. Select materials for longevity and minimal deterioration under conditions of use.

[DSA-SS] Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RVC) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.

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

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

SECTION A5.407
WATER RESISTANCE AND MOISTURE MANAGEMENT

A5.407.3 Weather protection. Provide a weather-resistant exterior wall and foundation envelope as required by *California Building Code* Section 1403.2 and *California Energy Code* Section 150, manufacturer's installation instructions or local ordinance, whichever is more stringent.

A5.407.4 Moisture control. Employ moisture control measures by the following methods.

A5.407.4.1 Sprinklers. Design and maintain landscape irrigation systems to prevent spray on structures.

A5.407.4.2 Entries and openings. Design exterior entries and/or openings subject to foot traffic or wind-driven rain to prevent water intrusion into buildings.

Notes:

1. Use features such as overhangs and recesses and flashings integrated with a drainage plane.
2. Use nonabsorbent floor and wall finishes within at least two feet around and perpendicular to such openings.

SECTION A5.408
CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

A5.408.3.1 Enhanced construction waste reduction. Divert to recycle or salvage nonhazardous construction and demolition debris generated at the site in compliance with one of the following:

Tier 1 At least a 65 percent reduction.

Tier 2. At least an 80 percent reduction.

A5.408.3.1.1 Verification of compliance. A copy of the completed waste management report shall be provided.

[DSA-SS] Divert to recycle or salvage nonhazardous construction and demolition debris generated at the site for at least an 80 percent reduction.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

A5.408.5 Construction waste diversion. Establish a construction waste management plan for the diverted materials or meet local construction and demolition waste management ordinance, whichever is more stringent.

A5.408.6 Construction waste reduction of at least 50 percent. Recycle and/or salvage for reuse a minimum of 50 per-

cent of the nonhazardous construction and demolition debris or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both.

Exceptions:

1. Excavated soil and land-clearing debris.
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

A5.408.7 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.

SECTION A5.409
LIFE CYCLE ASSESSMENT

A5.409.1 Materials and system assemblies. Select materials assemblies based on life cycle assessment of their embodied energy and/or green house gas emission potentials.

Notes:

1. Software for calculating life cycle costs for materials and assemblies may be found at:
   a. The Athena Institute website.
   b. The NIST BEES website.
   c. Life Cycle assessment may also be done in accordance with ISO Standard 14044.
2. More information on life cycle assessment may be found at the Sustainable Products Purchasers Coalition; at the American Center for Life Cycle Assessment; at U.S. EPA Life Cycle Assessment Research; and at U.S. EPA Environmentally Preferable Products.

SECTION A5.410
BUILDING MAINTENANCE AND OPERATION

A5.410.3 Commissioning. 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 project requirements. Commissioning shall be performed in accordance with this section by personnel trained and certified in commissioning by a nationally recognized organization. Commissioning requirements shall include as a minimum:

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

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

A5.410.3.1 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. At a minimum, this documentation shall include the following:

1. Environmental and sustainability goals
2. Energy efficiency goals
3. Indoor environmental quality requirements
4. Equipment and systems expectations
5. Building occupant and O&M personnel expectations

A5.410.3.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the owner's project requirements shall be completed at the design phase of the building project and updated as necessary during the design and construction phases. At a minimum, the Basis of Design document shall cover the following systems:

1. Heating, ventilation, air conditioning (hvac) systems and controls
2. Indoor lighting system and controls
3. Water heating system
4. Renewable energy systems

A5.410.3.3 Commissioning plan. A commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. The commissioning plan shall include the following at a minimum:

1. General project information
2. Commissioning goals
3. Systems to be commissioned. Plans to test systems and components shall include at a minimum:
   a. A detailed 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 requirements listed in Sections A5.410.4.4 through A5.410.4.6 shall be included.

A5.410.3.4 Functional performance testing. 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.

A5.410.3.5 Documentation and training. A systems manual and systems operations training are required.

A5.410.3.5.1 Systems manual. Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner and facilities operator. At a minimum, 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

A5.410.3.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall include, as a minimum, the following:

1. System/equipment overview (what it is, what it does and what other systems and/or equipment it interfaces with)
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

A5.410.3.6 Commissioning report. A complete report of commissioning process activities undertaken through the design and construction and reporting recommendations for postconstruction phases of the building project shall be completed and provided to the owner.

A5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.

A5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting and balancing shall include at a minimum, as applicable to the project:

1. HVAC systems and controls
2. Indoor and outdoor lighting and controls
3. Water heating systems
4. Renewable energy systems

A5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with industry best practices and applicable national standards on each system.

A5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards, the National Environmental Balancing Bureau Procedural Standards or Associated Air Balance Council National Standards.

A5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.

A5.410.4.5 Operation and maintenance manual. Provide the building owner with detailed operating and maintenance instructions and copies of guaranties/warranties for each system prior to final inspection.

Notes:

1. Software for calculating life cycle costs for materials and assemblies may be found at: The Athena Institute website;

   The NIST BEES website;

   Life Cycle assessment may also be done in accordance with ISO Standard 14044.

2. More information on life cycle assessment may be found at the Sustainable Products Purchasers Coalition; at the American Center for Life Cycle Assessment; at U.S. EPA Life Cycle Assessment Research; and at U.S. EPA Environmentally Preferable Products.

A5.410.6 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
Adopt entire CA chapter																			
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below	**X**						**X**	**X**	**X**		**X**								
Chapter/Section																			
A5.501.1	X						X												
A5.502.1 Definitions	X						X												
A5.504.1 and subsections	X						X												
A5.504.2	X						X												
A5.504.2.1 and subsections	X																		
A5.504.4.5.1	X							X	X		X								
A5.504.4.7	X						X												
A5.504.4.7.1	X																		
A5.504.4.7.2	X																		
A5.504.4.8	X						X												
A5.504.4.8.1	X						X												
A5.504.4.8.2	X																		
A5.504.4.9	X						X	X	X		X								
A5.504.4.9.1	X																		
A5.504.5	X						X	X	X		X								
A5.504.5.1	X						X	X	X		X								
A5.504.5.2	X						X												
A5.504.5.3.1	X						X												
A5.504.8 and subsections and tables								X	X		X								
Table A5.504.8.5	X						X	X	X		X								
A5.504.9								X	X		X								
A5.505								X	X		X								
A5.507.1 and subsections	X						X												
A5.507.2	X						X												
A5.507.3 and subsections	X						X												
A5.507.5							X												
A5.508	X																		

APPENDIX A5

NONRESIDENTIAL VOLUNTARY MEASURES

Division A5.5 – ENVIRONMENTAL QUALITY

SECTION A5.501
GENERAL

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

SECTION A5.502
DEFINITIONS

A5.502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

INTERIOR, BUILDING. The inside of the weatherproofing system.

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

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

NO ADDED FORMALDEHYDE (NAF) RESIN. Resin formulated with no added formaldehyde as part of the cross linking structure for making hardwood plywood, particle board or medium density fiberboard. "No added formaldehyde" resins include, but are not limited to, resins made from soy, polyvinyl acetate or methylene diisocyanate.

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

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

SECTION A5.504
POLLUTANT CONTROL

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

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

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

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

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

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

1. During this time, maintain an internal temperature of at least 60°F and relative humidity no higher than 60 percent. If extenuating circumstances make these temperature and humidity limits unachievable, the flush-out may be conducted under conditions as close as possible to these limits, provided that documentation of the extenuating circumstances is provided in writing.

2. Occupancy may start after 4 days, provided flush-out continues for the full 14 days. During occupied times, the thermal comfort conditions of Title 24 must be met.
3. For buildings that rely on natural ventilation, exhaust fans and floor fans must be used to improve air mixing and removal during the 14-day flush-out and windows should remain open.
4. Do not "bake out" the building by increasing the temperature of the space.
5. (If continuous ventilation is not possible, flush-out air must total the equivalent of 14 days of maximum outdoor air.) The equivalent of 14 days of maximum outdoor air shall be calculated by multiplying the maximum feasible air flow rate (in ft^3/m). The air volumes for each period are then calculated and summed and the flush-out continues until the total equals the target air volume.

A5.504.2.1 IAQ testing. If the engineer determines that building flush-out pursuant to Section A5.504.2 is not feasible, a testing alternative may be employed after all interior finishes have been installed, using testing protocols recognized by the United States Environmental Protection Agency (U.S. EPA).

A5.504.2.1.1 Maximum levels of contaminants. Allowable levels of contaminant concentrations measured by testing shall not exceed the following:

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

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

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

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

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

A5.504.4.5.1 Early compliance with formaldehyde limits. Where complying composite wood product is readily available for nonresidential occupancies, meet requirements before the compliance dates indicated in Table A5.504.8.5 (Tier 1) or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins (Tier 2).

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

A5.504.4.7 Resilient flooring systems, Tier 1 [DSA-SS] Resilient flooring systems. For 80 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List or certified under the FloorScore program of the Resilient Floor Covering Institute.

A5.504.4.7.1 Resilient flooring systems, Tier 2. For 90 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List (or Product Registry) or certified under the FloorScore program of the Resilient Floor Covering Institute (RFCI).

Note: Products compliant with CHPS criteria certified under the Greenguard Children & Schools program may also be used.

A5.504.4.7.2 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.

A5.504.4.8 Thermal insulation, Tier 1 [DSA-SS] Thermal insulation. Comply with Chapters 12 – 13 (Standards for Insulating Material) in Title 24, Part 12, the California Referenced Standards Code and with the VOC-emission limits defined in 2009 CHPS criteria and listed on its Low-emitting Materials List, [BSC] (or Product Registry).

A5.504.4.8.1 Thermal insulation, Tier 2 [BSC] Thermal insulation, No-Added Formaldehyde. [DSA-SS] Install No-Added Formaldehyde thermal insulation in addition to meeting the 2009 CHPS criteria and listed on

its Low-Emitting Materials List [BSC] (or Product Registry).

A5.504.4.8.2 Verification of compliance. Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.

A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2, the *California Building Code* and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List, [BSC, OSHPD 1, 2 and 4] (or Product Registry).

A5.504.4.9.1 Verification of compliance. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.

Note: Products compliant with CHPS criteria certified under the Greenguard Children & Schools program may also be used.

Note: [DSA-SS, OSHPD 1, 2 and 4] Documentation shall be provided that verifies that finish materials are certified to meet the pollutant emission limits.

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

A5.504.5.1 Entryway systems. Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors.

1. Qualifying entryways are those that serve as regular entry points for building users.
2. Acceptable entryway systems include, but are not limited to, permanently installed grates, grilles or slotted systems that allow cleaning underneath.
3. Roll-out mats are acceptable only when maintained regularly by janitorial contractors as documented in service contract or by in-house staff as documented by written policies and procedures.

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

1. Exhaust each space with no air recirculation in accordance with ASHRAE 62.1, Table 6-4 to create negative pressure with respect to adjacent spaces with the doors to the room closed.
2. For each space, provide self-closing doors and deck to deck partitions or a hard ceiling.
3. Install low-noise, vented range hoods for all cooking appliances and in laboratory or other chemical mixing areas.

A5.504.5.3.1 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 11.

A5.504.8 Finish material pollutant control. Finish materials shall comply with Sections 5.504.8.1 through 5.504.8.4.

A5.504.8.1 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 A5.504.8.1 and A5.504.8.2. 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.

Note: Title 17 may be found at http://ccr.oal.ca.gov/.

TABLE A5.504.8.1
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 A5.504.8.2
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	250
Porous	775
Modified bituminous	500
Marine deck	760
Other	750

Note: For additional information regarding methods to measure the VOC content specified in these tables, see South Coast Air Quality Management District Rule 1168: http://www.arb.ca.gov/DRDB/SC/CURHTML/R1168.PDF.

A5.504.8.3 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 A5.504.8.3, unless local limits apply. The VOC content limit for coatings that do not meet the definitions for the specialty coatings categories listed in Table A5.504.8.3, 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 A5.504.8.3 shall apply.

A5.504.8.3.1 Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations*, Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49.

A5.504.8.3.2 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. Manufacturers product specification
2. Field verification of on-site product containers

A5.504.8.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the following:

1. Carpet and Rug Institute's Green Label Plus Program
2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350)
3. NSF/ANSI 140 at the Gold level
4. Scientific Certifications Systems Sustainable Choice

TABLE A5.504.8.3
VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS[2, 3]
Grams of VOC Per Liter of Coating,
Less Water and Less Exempt Compounds

COATING CATEGORY	EFFECTIVE 1/1/2010	EFFECTIVE 1/1/2012
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	400	250
Shellacs:		
Clear	730	
Opaque	550	
Specialty primers, sealers and undercoaters	350	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 at Air Resources Board.

A5.504.8.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

A5.504.8.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table A5.504.8.1.

A5.504.8.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in ARB's Air Toxics Control Measure for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections, as shown in Table A5.504.8.5

A5.504.8.5.2 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. Other methods acceptable to the enforcing agency

TABLE A5.504.8.5
FORMALDEHYDE LIMITS[1]
Maximum formaldehyde emissions in parts per million.

Product	Current Limit	Jan 1, 2012	July 1, 2012
Hardwood plywood veneer core	0.05		
Hardwood plywood composite core	0.08		0.05
Particle board	0.09		
Medium density fiberboard	0.11		
Thin medium density fiberboard[2]	0.21	0.13	

1. Values in this table are derived from those specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333-96 (2002). For additional information, see *California Code of Regulations*, Title 17, Sections 93120 through 93120.12.
2. Thin medium density fiberboard has a maximum thickness of eight millimeters.

A5.504.9 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 in buildings; 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 A5.505
INDOOR MOISTURE CONTROL

A5.505.2 Indoor moisture control. Buildings shall meet or exceed the provisions of *California Building Code*, CCR, Title 24, Part 2, Sections 1203 and Chapter 14.

SECTION A5.507
ENVIRONMENTAL COMFORT

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

A5.507.1.1 Single-occupant spaces. Provide individual controls that meet energy use requirements in the 2007 *California Energy Code* in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2.

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

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

1. Occupants shall have control over at least one of the factors of air temperature, radiant temperature, air speed and humidity as described in ASHRAE 55-2004.
2. Occupants inside 20 feet of the plane of and within 10 feet either side of operable windows can substitute windows to control thermal comfort. The areas of operable window must meet the requirements of Section 121 (Requirement for Ventilation) of the *California Energy Code.*

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

A5.507.2 Daylight. Provide daylit spaces as required for toplighting and sidelighting in the 2007 *California Energy Code*. In constructing a design, consider the following:

1. Use of light shelves and reflective room surfaces to maximize daylight penetrating the rooms
2. Means to eliminate glare and direct sun light, including through skylights
3. Use of photosensors to turn off electric lighting when daylight is sufficient
4. Not using diffuse daylighting glazing where views are desired

A5.507.3 Views. Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90 percent of all regularly occupied areas as demonstrated by plan view and section cut diagrams.

A5.507.3.1 Interior office spaces. Entire areas of interior office spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.

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

Exceptions to Sections A5.507.2 and A5.507.3. Copy/printing rooms, storage areas, mechanical spaces, restrooms, auditoria and other intermittently or infrequently occupied spaces or spaces where daylight would interfere with use of the space.

A5.507.5 Acoustical control. Public Schools and Community Colleges: Unoccupied, furnished classrooms must have a maximum background noise level of no more than 45 dBA LAeq and a maximum (unoccupied, furnished) reverberation of 0.6-second time for classrooms with less than 10,000 cubic feet and a maximum (unoccupied, furnished) reverberation of 0.7-second time for classroom volumes with between 10,000 cubic feet and 20,000 cubic feet.

SECTION A5.508
OUTDOOR AIR QUALITY

A5.508.1.3 Hydrochlorofluorocarbons (HCFCs). Install HVAC and refrigeration equipment that do not contain HCFCs.

A5.508.1.4 Hydrofluorocarbons (HFCs). Install HVAC complying with either of the following:

1. Install HVAC, refrigeration and fire suppression equipment that do not contain HFCs or that do not contain HFCs with a global warming potential greater than 150.
2. Install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a global warming potential no greater than 1.

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

Adopting agency			HCD			DSA		OSHPD											
	BSC	SFM	1	2	1-AC	AC	SS	1	2	3	4	CSA	DPH	AGR	DWR	CEC	CA	SL	SLC
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 - First paragraph under Nonresidential Voluntary Measures title.																			

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. In order to meet one of the tier levels designers, builders or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level.

A5.601.2 *CALGreen* Tier 1

A5.601.2.1 Prerequisites. To achieve *CALGreen* Tier 1 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 energy efficiency standards in this code the California Energy Commission will continue to adopt mandatory building standards.

Using an alternative calculation method approved by the California Energy Commission, calculate each nonresidential building's TDV energy and CO_2 emissions and compare it to the standard or "budget" building.

A5.601.2.3 Tier 1. Exceed *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards, by 15 percent. Field verify and document the measures and calculations used to reach the desired level of efficiency following the requirements specified in the Title 24 *Nonresidential Alternative Calculation Method Manual.*

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

1. From Division A5.1,
   a. Comply with the designated parking requirements for fuel efficient vehicles for a minimum of 10 percent of parking capacity per Section A5.106.5.1 and Table A5.106.5.1.1.
   b. Comply with thermal emittance, solar reflectance or SRI values for cool roofs in Section A5.106.11.2 and Table A5.106.11.2.1.[1]
   c. Comply with one elective measure selected from this division.
2. From Division A5.3,
   a. Comply with the reduction for indoor potable water use in Section A5.303.2.3.1.
   b. Comply with the reduction in outdoor potable water use in Section A5.304.4.1.
   c. Comply with one elective measure selected from this division.
3. From Division A5.4,
   a. Comply with recycled content of 10 percent of materials based on estimated total cost in Section A5.405.4.
   b. Comply with the 65 percent reduction in construction 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 80 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.

A5.601.3 *CALGreen* Tier 2.

A5.601.3.1 Prerequisites. To achieve *CALGreen* Tier 2 status, a project must meet all of the mandatory measures in Chapter 5 and, in addition, meet the provisions of this section.

A5.601.3.2 Energy performance. For the purposes of energy efficiency standards in this code the California Energy Commission will continue to adopt mandatory building standards.

Using an Alternative Calculation Method approved by the California Energy Commission, calculate each nonresidential building's TDV energy and CO_2 emissions and compare it to the standard or "budget" building.

A5.601.3.3 Tier 2. Exceed *California Energy Code* requirements, based on the 2008 *Energy Efficiency Standards*, by 30 percent. Field verify and document the measures and calculations used to reach the desired level of efficiency following the requirements specified in the Title 24 *Nonresidential Alternative Calculation Method Manual.*

A5.601.3.4 Voluntary measures for CALGreen 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 reduction for indoor potable water use in Section A5.303.2.3.2.
    b. Comply with the reduction in outdoor potable water use in Section A5.304.4.2.
    c. Comply with three elective measures selected from this division.
3. From Division A5.4,
    a. Comply with recycled content of 15 percent of materials based on estimated total cost in Section A5.405.4.1.
    b. Comply with the 80 percent reduction in construction 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 90 percent of resilient flooring in Section A5.504.4.7.1.
    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.

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.

[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 by 15 or 30 percent and to mitigate heat island effect.

Division A5.7 – NONRESIDENTIAL CHECKLISTS

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Requirements			
Project meets all of the requirements of Divisions 5.1 through 5.5.	☒	☐	☐
Planning and Design			
Site Selection			
A5.103.1 Community connectivity. Locate project on a previously developed site within a $^1/_2$ mile radius of at least ten basic services, listed in Section A5.103.1.		☐	☐
A5.103.2 Brownfield or greyfield site redevelopment or infill area development. 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. **A5.103.3.1 Brownfield redevelopment.** Develop a site documented as contaminated and fully remediated or on a site defined as a brownfield.		☐	☐
Site Preservation			
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.		☐	☐
Deconstruction and Reuse of Existing Structures			
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 for reuse on this project in an onsite storage area or for salvage in dedicated collection bins. Document the weight or number of the items salvaged.			☐
Site Development			
5.106.1 Storm water pollution prevention plan. For projects of one acre or less, develop a Storm Water Pollution Prevention Plan (SWPPP) that has been designed, specific to its site, conforming to the State Storm water NPDES Construction Permit or local ordinance, whichever is stricter, as is required for projects over one acre. The plan should cover prevention of soil loss by storm water run-off and/or wind erosion, of sedimentation and/or of dust/particulate matter air pollution.	☒		
A5.106.2 Storm water design. Design storm water runoff rate and quantity in conformance with Section A5.106.3.1 and storm water runoff quality by Section A5.106.3.2 or by local requirements, whichever are stricter. **A5.106.2.1 Storm water runoff rate and quantity.** Implement a storm water management plan resulting in no net increase in rate and quantity of storm water runoff from existing to developed conditions. **Exception:** If the site is already greater than 50 percent impervious, implement a storm water management plan resulting in a 25 percent decrease in rate and quantity.		☐	☐
A5.106.2.2 Storm water runoff quality. Use post construction treatment control best management practices (BMPs) to mitigate (infiltrate, filter or treat) storm water runoff from the 85th percentile 24-hour runoff event (for volume-based BMPs) or the runoff produced by a rain event equal to two times the 85th percentile hourly intensity (for flow-based BMPs).		☐	☐
A5.106.3 Low impact development (LID). Reduce peak runoff in compliance with Section 5.106.3.1. Employ at least two of the following methods or other best management practices to allow rainwater to soak into the ground, evaporate into the air or collect in storage receptacles for irrigation or other beneficial uses. LID strategies include, but are not limited to those listed in Section A5.106.4.		☐	☐

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
5.106.4 Bicycle parking and changing rooms. Comply with Sections 5.106.4.1 and 5.106.4.2; or meet local ordinance, whichever is stricter.	☒		
5.106.4.1 Short-Term bicycle parking. If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.	☒		
5.106.4.2 Long-Term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space.	☒		
A5.106.4.3 Changing rooms. For buildings with over 10 tenant-occupants, provide changing/shower facilities in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.		☐	☐
A5.106.5.1 Designated parking for fuel-efficient vehicles. Provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in:			
Table A5.106.5.1.1 for Tier 1 at 10 percent of total spaces		☒	
Table A5.106.5.1.2 for Tier 2 at 12 percent of total spaces			☒
5.106.5.2 Designated parking. Provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.6.2.	☒		
A5.106.5.3.1 Electric vehicle supply wiring. For each space required in Table A406.1.6.2.1, provide one 120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets and as shown in Table A5.106.5.3.1.		☐	☐
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.		☐	☐
A5.106.7 Exterior walls. Meet requirements in the current edition of the *California Energy Code* and select one of the following for wall surfaces:			
1. Provide vegetative or man-made shading devices for east-, south- and west-facing walls with windows.	☐		
2. Use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.	☐		
5.106.8 Light pollution reduction. Comply with lighting power requirements in the *California Energy Code* and design interior and exterior lighting such that zero direct-beam illumination leaves the building site. Meet or exceed exterior light levels and uniformity ratios for lighting zones 1 – 4 as defined in Chapter 10 of the *California Administrative Code*, using the following strategies:	☒		
1. Shield all exterior luminaires or use cutoff luminaires.	☒		
2. Contain interior lighting within each source.	☒		
3. Allow no more than .01 horizontal foot candle 15 ft beyond the site.	☒		
4. Contain all exterior lighting within property boundaries.	☒		
Exception: See Part 2, Chapter 12, Section 1205.6 for campus lighting requirements for parking facilities and walkways.			
A5.106.9 Building orientation. Locate and orient the building as follows:			
1. Long sides facing north and south		☐	☐
2. Protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-driven materials.		☐	☐
5.106.10 Grading and paving. The site shall be planned and developed to keep surface water away from buildings. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows.	☒		
A5.106.11 Heat island effect. Reduce nonroof heat islands and roof heat islands as follows:			
A5.106.11.1 Hardscape alternatives. Use one or a combination of strategies 1 through 3 for 50 percent of site hardscape or put 50 percent of parking underground.		☐	☐
1. Provide shade (mature within 5 years of occupancy).		☐	☐
2. Use light colored/ high-albedo materials.		☐	☐
3. Use open-grid pavement system.		☐	☐
A5.106.11.2 Cool roof. Use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 equal to or greater than the values shown in:			
Table A5.106.11.2.1 – Tier 1 or		☐	
Table A5.106.11.2.2 – Tier 2		☐	☐

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Energy Efficiency			
Performance Requirements			
5.201.1 Scope. The California Energy Commission will continue to adopt mandatory building standards.[1]	☒		
A5.203.1 Energy performance. Using an Alternative Calculation Method approved by the California Energy Commission, calculate each nonresidential building's TDV energy and CO_2 emissions and compare it to the standard or "budget" building.			
A5.203.1.1 Tier 1. Exceed *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards, by 15 percent.		☒	
A5.203.1.2 Tier 2. Exceed *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards, by 30 percent.			☒
Prescriptive Measures			
A5.204.1 ENERGY STAR equipment and appliances. All equipment and appliances provided by the builder shall be ENERGY STAR labeled if ENERGY STAR is applicable to that equipment or appliance.		☐	☐
A5.204.2 Energy monitoring. Provide submetering or equivalent combinations of sensor measurements and thermodynamic calculations, if appropriate, to record energy use data for each major energy system in the building.		☐	☐
A5.204.2.1 Data storage. The data management system must be capable of electronically storing energy data and creating user reports showing hourly, daily, monthly and annual energy consumption for each major energy system.		☐	☐
A5.204.2.2 Data access. Hourly energy use data shall be accessible through a central data management system and must be available daily.		☐	☐
A5.204.3 Demand response. HVAC systems with Direct Digital Control Systems and centralized lighting systems shall include preprogrammed demand response strategies that are automated with either a Demand Response Automation Internet Software Client or dry contact relays.		☐	☐
A5.204.3.1 HVAC. The preprogrammed demand response strategies should be capable of reducing the peak HVAC demand by cooling temperature set point adjustment.		☐	☐
A5.204.3.2 Lighting. The preprogrammed demand response strategies should be capable of reducing the total lighting load by a minimum 30 percent through dimming control or bi-level switching.		☐	☐
A5.204.3.3 Software clients. The software clients will be capable of communicating with a DR Automation Server.		☐	☐
Renewable Energy			
A5.211.1 On-site renewable energy. Use on-site renewable energy for at least 1 percent of the electrical service overcurrent protection device rating calculated in accordance with the 2007 *California Electrical Code* or 1KW, whichever is greater, in addition to the electrical demand required to meet 1 percent of natural gas and propane use calculated in accordance with the 2007 *California Plumbing Code.*		☐	☐
A5.211.1.1 Documentation. Calculate renewable on-site system to meet the requirements of Section A5.211.1. Factor in net-metering, if offered by local utility, on an annual basis.			
A5.211.3 Green power. Participate in the local utility's renewable energy portfolio program that provides a minimum of 50 percent electrical power from renewable sources. Maintain documentation through utility billings.		☐	☐
A5.211.4 Prewiring for future solar. Install conduit from the building roof or eave to a location within the building identified as suitable for future installation of a charge controller (regulator) and inverter.		☐	☐
A5.211.4.1 Off-grid prewiring for future solar. If battery storage is anticipated, conduit should run to a location within the building that is stable, weather-proof, insulated against very hot and very cold weather and isolated from occupied spaces.		☐	☐
Elevators, Escalators and Other Equipment			
A5.212.1 Elevators and escalators. In buildings with more than one elevator or two escalators, provide controls to reduce the energy demand of elevators and reduce the speed of escalators. Document the controls in the project specifications and commissioning plan.		☐	☐
Energy Efficient Steel Framing			
A5.213.1 Steel framing. Design for and employ techniques to avoid thermal bridging.		☐	☐

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Water Efficiency and Conservation			
Indoor Water Use			
5.303.1 Meters. Separate meters shall be installed for the uses described in Sections 503.1.1 through 503.1.3.			
5.303.1.1 Buildings 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.	☒		
2. For spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory or beauty salon or barber shop projected to consume more than 100 gal/day.	☒		
5.303.1.2 Excess consumption. Any building within a project or space within a building that is projected to consume more than 1,000 gal/day.	☒	☐	☐
5.303.2 20 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. (Calculate savings by Water Use Worksheets)	☒		
5.303.2.1 Multiple showerheads serving one shower. When single shower fixtures are served by more than one showerhead, the combined flow rate of all the showerheads shall not exceed the maximum flow rates specified in the 20 percent reduction column contained in Table 5.303.2.3 or the shower shall be designed to only allow one showerhead to be in operation at a time.	☒		
A5.303.2.3.1 Tier 1 – 30 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 30 percent shall be provided.		☒	
A5.303.2.3.2 Tier 2 – 35 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 35 percent shall be provided.			☒
A5.303.2.3.3 40 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 40 percent shall be provided. (Calculate savings by Water Use Worksheets)		☐	☐
5.303.4 Wastewater reduction. Each building shall reduce the generation of wastewater by one of the following methods:	As applicable		
1. The installation of water-conserving fixtures or	☒		
2. Utilizing nonpotable water systems.	☒		
A5.303.3 Appliances.			
1. Clothes washers shall have a maximum Water Factor (WF) that will reduce the use of water.		☐	☐
2. Dishwashers shall meet the criteria in Section A5.303.3(2)(a) and (b).		☐	☐
3. Ice makers shall be air cooled.		☐	☐
4. Food steamers shall be connectionless or boilerless.		☐	☐
5. The use and installation of water softeners shall be limited or prohibited by local agencies.		☐	☐
A5.303.5 Dual plumbing. New buildings and facilities shall be dual plumbed for potable and recycled water systems.		☐	☐
5.303.6 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the requirements listed for each type in Items listed in Table 5.303.6.	As applicable		
1. Water closets (toilets) – flushometer type	☒		
2. Water closets (toilets) – tank type	☒		
3. Urinals	☒		
4. Public lavatory faucets	☒		
5. Public metering self-closing faucets	☒		
6. Residential bathroom lavatory sink faucets	☒		
7. Residential kitchen faucets	☒		
8. Residential shower heads	☒		
9. Single shower fixtures served by more than one showerhead	☒		

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Outdoor Water Use			
5.304.1 Water budget. A water budget shall be developed for landscape irrigation use.[1]	☒		
5.304.2 Outdoor potable water use. For new water service, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas between 1,000 square feet and 5,000 square feet. **A5.304.2.1 Outdoor potable water use.** For new water service not subject to the provisions of *Water Code* Section 535, separate meters or submeters shall be installed for indoor and outdoor potable water use for landscaped areas between 500 square feet and 1,000 square feet.	☒		
5.304.3 Irrigation design. In new nonresidential projects with between 1,000 and 2,500 square feet of landscaped area (the level at which the MLO applies), install irrigation controllers and sensors which include the following criteria and meet manufacturer's recommendations. **5.304.3.1 Irrigation controllers.** Automatic irrigation system controllers installed at the time of final inspection shall comply with the following: 1. Controllers shall be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plants' needs as weather conditions change. 2. Weather-based controllers without integral rain sensors or communication systems that account for local rainfall shall have a separate wired or wireless rain sensor which connects or communicates with the controller(s). Soil moisture-based controllers are not required to have rain sensor input.	☒ As applicable ☒		
A5.304.4 Potable water reduction. Provide water efficient landscape irrigation design that reduces by the use of potable water. **A5.304.4.1 Tier 1** – Reduce the use of potable water to a quantity that does not exceed 60 percent of ETo times the landscape area. **A5.304.4.2 Tier 2** –Reduce the use of potable water to a quantity that does not exceed 55 percent of ETo times the landscape area. Methods used to accomplish the requirements of this section shall include, but not be limited to, the items listed in A5.304.4. **A5.304.4.3 Verification of compliance.** A calculation demonstrating the applicable potable water use reduction required by this section shall be provided.		☒ ☒	☒ ☒
A5.304.5 Potable water elimination. Provide a water efficient landscape irrigation design that eliminates the use of potable water beyond the initial requirements for plant installation and establishment. Methods used to accomplish the requirements of this section shall include, but not be limited to, the items listed in Section A5.304.4.		☐	☐
A5.304.6 Restoration of areas disturbed by construction. Restore all areas disturbed during construction by planting with local native and/or noninvasive vegetation.		☐	☐
A5.104.7 Previously developed sites. On previously developed or graded sites, restore or protect at least 50 percent of the site area with native and/or noninvasive vegetation.		☐	☐
A5.304.8 Graywater irrigation system. Install graywater collection system for onsite subsurface irrigation using graywater.		☐	☐
Material Conservation and Resource Efficiency			
Efficient Framing Systems			
A5.404.1 Wood framing. Employ advanced wood framing techniques or OVE, as permitted by the enforcing agency.		☐	☐
Material Sources			
A5.405.1 Regional materials. Select building materials or products for permanent installation on the project that have been harvested or manufactured in California or within 500 miles of the project site, meeting the criteria listed in Section A5.405.1.		☐	☐
A5.405.2 Bio-based materials. Select bio-based building materials per Section A5.405.2.1 or A5.405.2.2. **A5.405.2.1 Certified wood products.** Certified wood is an important component of green building strategies and the California Building Standards Commission will continue to develop a standard through the next code cycle. **A5.405.2.2 Rapidly renewable materials.** Use materials made from plants harvested within a ten-year cycle for at least 2.5 percent of total materials value, based on estimated cost.		☐ ☐	☐ ☐
A5.405.3 Reused materials. Use salvaged, refurbished, refinished or reused materials for at least 5 percent of the total value, based on estimated cost of materials on the project.		☐	☐

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
A5.405.4 Recycled content, Tier 1. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) equaling at least 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.		☒	
A5.405.4.1 Recycled content, Tier 2. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 15 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.			☒
A5.405.5 Cement and concrete. Use cement and concrete made with recycled products and complying with the following sections:			
A5.405.5.1 Cement. Meet the following standards for cement:			
1. Portland cement shall meet ASTM C 150.			
2. Blended hydraulic cement shall meet ASTM C 595.		☐	☐
A5.405.5.2 Concrete. Unless otherwise directed by the engineer, use concrete manufactured with cementitious materials in accordance with Sections A5.405.5.2.1 and A5.405.5.2.2, as approved by the enforcing agency.			
A5.405.5.2.1 Supplementary cementitious materials (SCMs). Use concrete made with one or more of the SCMs listed in Section A5.405.5.2.1.		☐	☐
A5.405.5.2.1.1 Mix design equation. Use any combination of one or more SCMs, satisfying Equation A4.5-1.		☐	☐
Exception: Minimums for concrete products requiring high early strength may be lower as directed by the engineer.			
A5.405.5.3 Additional means of compliance. Any of the following measures may be employed for the production of cement or concrete, depending on their availability and suitability, in conjunction with Section A5.405.5.2.			
A5.405.5.3.1 Cement. The following measures may be used in the manufacture of cement.			
A5.405.5.3.1.1 Alternative fuels. Where permitted by state or local air quality standards, use alternative fuels.		☐	☐
A5.405.5.3.1.2 Alternative power. Use alternate electric power generated at the cement plant and/or green power purchased from the utility meeting the requirements of Section A5.211.		☐	☐
A5.405.5.3.1.3 Alternative ingredients. Use inorganic processing additions and limestone meeting ASTM C 150.		☐	☐
A5.405.5.3.2 Concrete. The following measures may be used in the manufacture of concrete,			
A5.405.5.3.2.1 Alternative energy. Use renewable or alternative energy meeting the requirements of Section A5.211.		☐	☐
A5.405.5.3.2.2 Recycled aggregates. Use concrete made with one or more of the materials listed in Section A5.405.5.3.2.2.		☐	☐
A5.405.5.3.2.3 Mixing water. Use water meeting ASTM C1602, either recycled water provided by the local water purveyor or water reclaimed from manufacturing processes.		☐	☐
Enhanced Durability and Reduced Maintenance			
A5.406.1.1 Service life. Select materials for longevity and minimal deterioration under conditions of use.		☐	☐
A5.406.1.2 Reduced maintenance. Select materials that require little, if any, finishing.		☐	☐
A5.406.1.3 Recyclability. Select materials that can be re-used or recycled at the end of their service life.		☐	☐
Weather 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 and *California Energy Code* Section 150, manufacturer's installation instructions or local ordinance, whichever is more stringent.[1]	☒		
5.407.2 Moisture control. Employ moisture control measures by the following methods;			
5.407.2.1 Sprinklers. Prevent irrigation spray on structures.	☒		
5.407.2.2 Entries and openings. Design exterior entries and openings to prevent water intrusion into buildings.	☒		

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Construction Waste Reduction, Disposal and Recycling			
5.408.1 Construction waste diversion. Establish a construction waste management plan or meet local ordinance, whichever is more stringent.	☒		
5.408.2 Construction waste management plan. Submit plan per this section to enforcement authority.	☒		
5.408.2.1 Documentation. Provide documentation of the waste management plan that meets the requirements listed in Section 5.408.2 Items 1 thru 4 and the plan is accessible to the enforcement authority.	☒		
5.408.2.2 Isolated jobsites. The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.		☐	☐
5.408.3 Construction waste. Recycle and/or salvage for reuse a minimum of 50 percent of nonhazardous construction and demolition debris or meet local ordinance, whichever is more stringent. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.	☒		
A5.408.3.1 Enhanced construction waste reduction. Divert to recycle or salvage nonhazardous construction and demolition debris generated at the site in compliance with one of the following: Tier 1. At least a 65 percent reduction		☒	
Tier 2. At least an 80 percent reduction			☒
A5.408.3.1.1 Verification of compliance. A copy of the completed waste management report shall be provided. **Exceptions:** 1. Excavated soil and land-clearing debris 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist	☒		
5.408.4 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.	☒		
Life Cycle Assessment			
A5.409.1 Materials and system assemblies. Select materials assemblies based on life cycle assessment of their embodied energy and/or green house gas emission potentials. See Sections A5.409.1.1 and A5.409.1.2 for available tools.		☐	☐
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 nonhazardous materials for recycling.[1]	☒		
5.410.2 Commissioning. For new buildings 10,000 square feet and over, building commissioning for all building systems covered by T24, Part 6, process systems and renewable energy systems shall be included in the design and construction processes of the building project. Commissioning requirements shall include items listed in Section 5.410.2.	☒		
5.410.2.1 Owner's Project Requirements (OPR). Documented before the design phase of the project begins the OPR shall include items listed in Section 5.410.4.	☒		
5.410.2.2 Basis of Design (BOD). 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 and updated periodically to cover the systems listed in Section 5.410.2.2.	☒		
5.410.2.3 Commissioning plan. A commissioning plan describing how the project will be commissioned shall be started during the design phase of the building project and shall include items listed in Section 5.410.2.3.	☒		
5.410.2.4 Functional performance testing shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications.	☒		
5.410.2.5 Documentation and training. A Systems manual and systems operations training are required.	☒		
5.410.2.5.1 Systems manual. The systems manual shall be delivered to the building owner or representative and facilities operator and shall include the items listed in Section 5.410.2.5.1.	☒		
5.410.2.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall include items listed in Section 5.410.2.5.2.	☒		
5.410.2.6 Commissioning report. A complete report of commissioning process activities undertaken through the design, construction and reporting recommendations for postconstruction phases of the building project shall be completed and provided to the owner or representative.	☒		

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet.			
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, the systems listed in Section 5.410.3.2.	☒		
5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with industry best practices and applicable national standards on each system.	☒		
5.410.4.3.1 HVAC balancing. Before a new space-conditioning system serving a building or space is operated for normal use, the system should be balanced in accordance with the procedures defined by national standards listed in Section 5.410.3.3.1.	☒		
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 manual. Provide the building owner with detailed operating and maintenance instructions and copies of guaranties/warranties for each system prior to final inspection.	☒		
5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.	☒		
Environmental Quality			
Fireplaces			
5.503.1 Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace or a sealed woodstove and refer to residential requirements in the *California Energy Code,* Title 24, Part 6, Subchapter 7, Section 150.	☒		
5.503.1.1 Woodstoves. Woodstoves shall comply with US EPA Phase II emission limits.	As applicable ☒		
Pollutant Control			
A5.504.1 Indoor air quality (IAQ) during construction. Maintain IAQ as provided in Sections A5.504.1.1 and A5.504.1.2.			
A5.504.1.1 Temporary ventilation. Provide temporary ventilation during construction in accordance with Section 121 of the *California Energy Code,* CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 and as listed in Items 1 through 4 in Section A5.504.1.2.		☐	☐
A5.504.1.2 Additional IAQ measures. Employ additional measures as listed in Items 1 through 5 in Section A5.504.1.3.		☐	☐
A5.504.2 IAQ postconstruction. Flush out the building per Section A5.504.2 prior to occupancy or if the building is occupied.		☐	☐
A5.504.2.1 IAQ Testing. A testing alternative may be employed after all interior finishes have been installed, using testing protocols recognized by the United State Environmental Protection Agency (U.S. EPA) and in accordance with Section A5.504.2.1.2. Retest as required in Section A5.504.2.1.3.		☐	☐
A5.504.2.1.1 Maximum levels of contaminants. Allowable levels of contaminant concentrations measured by testing shall not exceed the following:		As applicable	As applicable
1. Carbon Monoxide (CO): 9 parts per million, not to exceed outdoor levels by 2 parts per million;		☐	☐
2. Formaldehyde: 27 parts per billion;		☐	☐
3. Particulates (PM10): 50 micrograms per cubic meter;		☐	☐
4. 4-Phenylcyclohexene (4-PCH): 6.5 micrograms per cubic meter; and		☐	☐
5. Total Volatile Organic Compounds (TVOC): 300 micrograms per cubic meter.		☐	☐
A5.504.2.1.2 Test protocols. Testing of indoor air quality should include the elements listed in Items 1 through 4.		☐	☐
A5.504.2.1.3 Noncomplying building areas. For each sampling area of the building exceeding the maximum concentrations specified in Section A5.504.2.1.1, flush out with outside air and retest samples taken from the same area. Repeat the procedures until testing demonstrates compliance.		☐	☐
5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation or during storage on the construction site and until final startup of the heating and cooling 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 or debris which may collect in the system.	☒		

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.4.			
5.504.4.1 Adhesives, sealants, caulks. Adhesives and sealants 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.	☒		
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.	☒		
5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with Table 5.504.4.3 unless more stringent local limits apply.	☒		
5.504.4.3.1 Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product-Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances (CCR, Title 17, Section 94520 et seq).	☒		
5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency.	☒		
5.504.4.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the standards listed in Section 5.504.4.4.	☒		
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 Green Label program.	☒		
5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 804.4.1.	☒		
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 Table 5.504.4.	☒		
A5.504.4.5.1 Early compliance with formaldehyde limits. Where complying composite wood product is readily available for nonresidential occupancies, meet Phase 2 requirements before the compliance dates indicated in Table 5.504.4.5 (Tier I) or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins (Tier II).		☐	
5.504.4.5.2 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.	☒	☐	☐
	As applicable		
1. Product certifications and specifications	☒		
2. Chain of custody certifications	☒		
3. Other methods acceptable to the enforcing agency	☒		
5.504.4.6 Resilient flooring systems. Comply with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List (or Product Registry) or certified under the FloorScore program of the Resilient Floor Covering Institute.	☒		
A5.504.4.6.1 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.	☒		
A5.504.4.7 Resilient flooring systems, Tier 1. For 80 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List (or Product Registry) or certified under the FloorScore program of the Resilient Floor Covering Institute.		☒	
A5.504.4.7.1 Resilient flooring systems, Tier 2. For 100 percent of floor area to scheduled to receive resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List (or Product Registry) or certified under the FloorScore program of the Resilient Floor Covering Institute.			☒
A5.504.4.7.2 Verification of compliance. Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.		☒	☒
A5.504.4.8 Thermal insulation, Tier 1. Comply with Chapter 12-13 in Title 24, Part 12 and with the VOC-emission limits defined in 2009 CHPS criteria and listed on its Low-emitting Materials List.		☒	
A5.504.4.8.1 Thermal insulation, Tier 2. Install No-Added Formaldehyde thermal insulation in addition to meeting Section A5.504.4.8.			☒
A5.504.4.8.2 Verification of compliance. Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.		☒	☒
A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2 and with the VOC-emission limits defined in the 2009 CHPS criteria and listed on its Low-emitting Materials List (or Product Registry).		☐	☐
A5.504.4.9.1 Verification of compliance. Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.		☐	☐

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
A5.504.5 Hazardous particulates and chemical pollutants. Minimize and control pollutant entry into buildings and cross-contamination of regularly occupied areas.			
A5.504.5.1 Entryway systems. Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors as listed in Items 1 through 3 in Section A5.504.5.1.		☐	☐
A5.504.5.2 Isolation of pollutant sources. In rooms where activities produce hazardous fumes or chemicals, exhaust them and isolate them from their adjacent rooms as listed in Items 1 through 3 in Section A5.504.5.2.		☐	☐
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 prior to occupancy that provides at least a MERV of 8.	☒		
A5.504.5.3.1 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a MERV of 11.		☐	☐
5.504.7 Environmental tobacco smoke (ETS) control. Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows where outdoor areas are provided for smoking and in buildings; 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.	☐		
Indoor Moisture and Radon 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 and Chapter 14.1.[1]	☒		
Air Quality and Exhaust			
5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 121 of the *California Energy Code*, CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 or the applicable local code, whichever is more stringent.[1]	☒		
5.506.2 Carbon dioxide (CO_2) monitoring. For buildings equipped with demand control ventilation, CO_2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the latest edition of the *California Energy Code*, CCR, Title 24, Part 6, Section 121(c).[1]	☒		
Environmental Comfort			
A5.507.1 Lighting and thermal comfort controls. Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.			
A5.507.1.1 Single-occupant spaces. Provide individual controls that meet energy use requirements in the 2007 *California Energy Code* by Sections A5.507.1.1.1 and A5.507.1.1.2.		☐	☐
A5.507.1.1.1 Lighting. Provide individual task lighting and/or daylighting controls for at least 90 percent of the building occupants.		☐	☐
A5.507.1.1.2 Thermal comfort. Provide individual thermal comfort controls for at least 50 percent of the building occupants by Items 1 and 2 in Section A5.507.1.1.2.		☐	☐
A5.507.1.2 Multi-occupant spaces. Provide lighting and thermal comfort system controls for all shared multi-occupant spaces.		☐	☐
A5.507.2 Daylight. Provide daylit spaces as required for toplighting and sidelighting in the 2007 *California Energy Code*. In constructing a design, consider Items 1 through 4 in Section A5.507.3.		☐	☐
A5.507.3 Views. Achieve direct line of sight to the outdoor environment via vision glazing between 2'6" and 7'6" above finish floor for building occupants in 90 percent of all regularly occupied areas.		☐	☐
A5.507.3.1 Interior office spaces. Entire areas of interior office spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.		☐	☐
A5.507.3.2 Multi-occupant spaces. Include in the calculation the square footage with direct line of sight to perimeter vision glazing.		☐	☐
5.507.4 Acoustical control. Employ building assemblies and components with STC values determined in accordance with ASTM E 90 and ASTM E 413.	☐		
5.507.4.1 Exterior noise transmission. Wall and floor-ceiling assemblies making up the building envelope shall have an STC of at least 50 and exterior windows shall have a minimum STC of 30 for any of the building locations listed in Items 1 through 3 in Section 5.507.5.1.	☐		
5.507.4.2 Interior sound. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.	☐		

continued

APPLICATION CHECKLIST FOR BSC	MANDATORY	VOLUNTARY	
		CALGreen Tier 1	*CALGreen* Tier 2
Outdoor Air Quality			
5.508.1 Ozone depletion and global warming reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.	As applicable		
5.508.1.1 CFCs. Install HVAC and refrigeration equipment that does not contain CFCs.[1]	☒		
5.508.1.2 Halons. Install fire suppression equipment that does not contain Halons.[1]	☒		
A5.508.1.3 Hydrochlorofluorocarbons (HCFCs). Install HVAC and refrigeration equipment that does not contain HCFCs.		☐	☐
A5.508.1.4 Hydrofluorocarbons (HFCs). Install HVAC complying with either of the following:			
1. Install HVAC, refrigeration and fire suppression equipment that do not contain HFCs or that do not contain HFCs with a global warming potential greater than 150.		☐	☐
2. Install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a global warming potential no greater than 1.		☐	☐

1. These measures are currently required elsewhere in statute or in regulation.

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
DIVISION 5.1 – PLANNING AND DESIGN		
Site Development		
A5.106.4 Bicycle parking and changing rooms. Comply with Sections 5.106.4.1 through 5.106.4.3; or meet local ordinance or the University of California Policy on Sustainable Practices, whichever is stricter.		☒
A5.106.4.1 Short-term bicycle parking. If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 yards of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.		☒
A5.106.4.2 Long-term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupant motorized vehicle parking capacity, with a minimum of one space. For public schools and community colleges provide secure bicycle parking for 15 percent of occupants (students, teachers and staff). Acceptable parking facilities shall be convenient from the street and may include, but not be limited to: 1. Covered, lockable enclosures with permanently anchored racks for bicycles; 2. Lockable bicycle rooms with permanently anchored racks; and 3. Lockable, permanently anchored bicycle lockers.		☒
A5.106.4.3 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. For public schools and community colleges, provide changing/shower facilities for the "number of administrative/teaching staff" equal to the "number of tenant-occupants" shown in Table 5.106.4.3. TABLE A5.106.4.3		☒
A5.106.5.1 Designated parking for fuel-efficient vehicles. 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 – 10 percent of Total Spaces		☒
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 VEHICLE		☒
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.		☒
A5.106.5.3 Electric vehicle charging. Provide facilities meeting Section 406.7 (Electric Vehicle) of the *California Building Code* and as follows:		☒
A5.106.5.3.1 Electric vehicle supply wiring. For each space required in Table A5.106.5.3.1, provide one 120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets. TABLE A5.106.5.3.1		☒
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.		☒
A5.106.7 Exterior wall shading. Meet requirements in the current edition of the *California Energy Code* and select one of the following for wall surfaces: 1. Provide vegetative or man-made shading devices for east-, south- and west-facing walls with windows as specified in Item 1 of this section. 2. Use wall surfacing with minimum SRI 25 (aged), for 75 percent of opaque wall areas.		☒ ☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
5.106.8 Light pollution reduction. Comply with lighting power requirements in the *California Energy Code*, CCR, Part 6 and design interior and exterior lighting such that zero direct-beam illumination leaves the building site. Meet or exceed exterior light levels and uniformity ratios for lighting zones 1 – 4 as defined in Chapter 10 of the *California Administrative Code*, CCR, Part 1, using the following strategies: 1. Shield all exterior luminaires or provide cutoff luminaires per Section 132 (b) of the *California Energy Code.* 2. Contain interior lighting within each source. 3. Allow no more than .01 horizontal lumen foot candles to escape 15 feet beyond the site boundary. 4. Automatically control exterior lighting dusk to dawn to turn off or lower light levels during inactive periods. **Exceptions:** 1. Part 2, Chapter 12, Section 1205.6 for campus lighting requirements for parking facilities and primary walkways. 2. Emergency lighting and lighting required for nighttime security.	☒	
A5.106.9 Building orientation. Locate and orient the building as follows: 1. When site and location permit orient the building with the long sides facing north and south. 2. Protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-driven materials such as dust, sand, snow and leaves with building orientation and landscape features.		☒
A5.106.9.1 Building orientation and shading. Locate orient and shade the building as follows: 1. Provide exterior shade for south-facing windows during the peak cooling season. In Public School and Community College buildings, shade may be provided by trees, solar shade structures or other alternate methods.		☒
5.106.10 Grading and paving. The site shall be planned and developed to keep surface water from entering buildings. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows.	☒	
A5.106.11 Heat island effect. Reduce nonroof heat islands by Section A5.106.11.1 and roof heat islands by Section A5.106.11.2.		☒
A5.106.11.1 Hardscape alternatives. Use one or a combination of strategies 1 through 3 for 50 percent of site hardscape or put 50 percent of parking underground. 1. Provide shade (mature within 5 years of occupancy). In Public School and Community College buildings, solar shade structures may be used in lieu of trees to provide required shade. 2. Use light colored/ high-albedo materials. 3. Use open-grid pavement system.		☒
A5.106.11.2 Cool roof. Use roofing materials having solar reflectance, thermal emittance or Solar Reflectance Index (SRI)3 equal to or greater than the values shown in: Table A5.106.11.2.1 – Tier 1 or Table A5.106.11.2.2 – Tier 2		☒
DIVISION 5.2 – ENERGY EFFICIENCY		
General		
5.201.1 Scope. For the purposes of mandatory energy efficiency standards in this code, the California Energy Commission will continue to adopt mandatory building standards.	☒	
Performance Approach		
A5.203.1.1 Energy efficiency – 15 percent above Title 24, Part 6. Exceed *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards, by 15 percent and meet the requirements of Division A45.6.		☒
A5.203.1.2 Energy efficiency – 30 percent above Title 24, Part 6. Exceed *California Energy Code* requirements, based on the 2008 Energy Efficiency Standards, by 30 percent and meet the requirements of Division A45.6.		☒
Prescriptive Approach		
A5.204.1 ENERGY STAR equipment and appliances. All equipment and appliances provided by the builder shall be ENERGY STAR labeled if ENERGY STAR is applicable to that equipment or appliance.		☒
A5.204.2 Energy monitoring. Provide submetering or equivalent combinations of sensor measurements and thermodynamic calculations, if appropriate, to record energy use data for each major energy system in the building, including chillers, heat pumps, packaged AC systems, fans, pumps, cooling towers, boilers and other heating systems, lighting systems and process loads. This energy use data, once collected, shall be stored within a data management system.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
A5.204.2.1 Data storage. The data management system must be capable of electronically storing energy data and creating user reports showing hourly, daily, monthly and annual energy consumption for each major energy system. Hourly data shall be retained a minimum of 30 days, daily data shall be retained a minimum of 6 months and monthly data shall be retained a minimum of 2 years.		☒
A5.204.2.2 Data access. Hourly energy use data shall be accessible through a central data management system and must be available daily.		☒
Renewable Energy		
A5.211.1 On-site renewable energy. Use on-site renewable energy sources such as solar, wind, geothermal, low-impact hydro, biomass and bio-gas for at least 1 percent of the electric power calculated as the product of the building service voltage and the amperage specified by the electrical service overcurrent protection device rating or 1kW (whichever is greater), in addition to the electrical demand required to meet 1 percent of the natural gas and propane use. The building project's electrical service overcurrent protection device rating shall be calculated in accordance with the 2007 *California Electrical Code*. Natural gas or propane use is calculated in accordance with the 2007 *California Plumbing Code*.		☒
A5.211.1.2 Grid neutral. Using the proposed annual electrical energy budget (kWh) as set forth by the Title 24, Part 6 of the *California Energy Code and* adding the additional annual energy consumption estimated for the appliances and equipment not covered by Title 24, Part 6 (e.g., kitchen and laundry equipment and appliances, swimming pool heaters and circulation pumps, industrial and art equipment, computers, etc.) calculate the site's annual electrical production and consumption ratio by dividing the proposed annual renewable electrical energy production (kWh) by the proposed annual electrical energy budget (kWh). The estimated plug loads shall be included in the annual electrical energy budget (kWh). Exceptions: 1. Existing buildings with one year of occupancy or greater shall use actual data of the annual electrical energy consumption of the facilities. Using the data logged for the facilities, calculate the site's annual electrical production and consumption ration by dividing the proposed annual renewable electrical energy production (kWh) by the actual annual electrical energy consumption (kWh). 2. The annual renewable electrical energy can be renewable energy produced off-site on a remote property owned by the applicant.		☒
A5.211.2.1 35 percent Grid neutral. A sites annual electrical production and consumption ratio is equal or greater than 0.35.		☒
A5.211.2.2 75 percent Grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 0.75.		☒
A5.211.2.3 Grid neutral. A site's annual electrical production and consumption ratio is equal or greater than 1.		☒
A5.211.3 Green power. Using a calculation method approved by the *California Energy Commission*, calculate the renewable on-site energy system to meet the requirements of Section 511.1, expressed in kW. Factor in net-metering, if offered by local utility, on an annual basis.		☒
A5.211.4 Prewiring for future solar. Install conduit from the building roof or eave to a location within the building identified as suitable for future installation of a charge controller (regulator) and inverter.		☒
A5.211.4.1 Off-grid prewiring for future solar. If battery storage is anticipated, conduit should run to a location within the building that is stable, weather-proof, insulated against very hot and very cold weather and isolated from occupied spaces.		☒
Elevators, Escalators and Other Equipment		
A5.212.1 Elevators and escalators. In buildings with more than one elevator or two escalators, provide controls to reduce the energy demand of elevators for part of the day and escalators to reduce speed when no traffic is detected. Document the controls in the project specifications and commissioning plan. In Public School and Community College buildings, locate stairs conveniently to encourage their use in lieu of elevators or escalators.		☒
A5.212.1.1 Controls. Controls that reduce energy demand shall meet requirements of CCR, Title 8, Chapter 4, Subchapter 6 and shall not interrupt emergency operations for elevators required in CCR, Title 24, Part 2, *California Building Code.*		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION		
Indoor Water Use		
5.303.2 20 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 20 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the *California Building Standards Code*. The 20 percent reduction in potable water use shall be demonstrated by one of the following methods: 1. Each plumbing fixture and fitting shall meet the 20 percent reduced flow rate specified in Table 5.303.2.3 or 2. A calculation demonstrating a 20 percent reduction in the building "water use baseline" as established in Table 5.303.2.2 shall be provided. TABLE 5.301.2.2 – INDOOR WATER USE BASELINE TABLE 5.303.2.3 – FIXTURE FLOW RATES	☒	
A5.303.2.3.1 30 percent savings. A schedule of plumbing fixtures and fixture fittings that will reduce the overall use of potable water within the building by 30 percent shall be provided. The reduction shall be based on the maximum allowable water use per plumbing fixture and fitting as required by the *California Building Standards Code*. The 30 percent reduction in potable water use shall be demonstrated by one of the following methods: 1. Each plumbing fixture and fitting shall meet the 30 percent reduced flow rate specified in Table A5.303.2.3.1 or 2. A calculation demonstrating a 30 percent reduction in the building "water use baseline" as established in Table A5.303.2.2 shall be provided. TABLE A5.303.2.2 – WATER USE BASELINE5 TABLE A5.303.2.3.1 – FIXTURE FLOW RATE		☒
A5.303.3 Appliances. 1. Clothes washer shall have a maximum water factor (WF) that will reduce the use of water by 10 percent below the California Energy Commission's 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—5.8 gallons per cycle. b. Commercial—refer to Table A5.303.3. TABLE A5.303.3 – COMMERCIAL DISHWASHER WATER USE 3. Ice makers shall be air cooled. 4. Food steamers shall be connectionless or boilerless.		☒
5.303.4 Wastewater reduction. Each building shall reduce by 20 percent wastewater by one of the following methods: 1. The installation of water-conserving fixtures (water closets, urinals) meeting the criteria established in Sections 5.303.2 or A5.303.3.	☒	
5.303.6 Plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall meet the standards referenced in Table 5.503.6. TABLE 5.303.6 - STANDARDS FOR PLUMBING FIXTURES AND FIXTURE FITTINGS	☒	
Outdoor Water Use		
A5.304.1.1 Water budget. A water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources Model Water Efficient Landscape Ordinance where no local ordinance is applicable.		☒
A5.304.4.4 Potable water reduction. Provide water efficient landscape irrigation design that reduces the use of potable water beyond the initial requirements for plant installation and establishment by 50 percent. Calculations for the reduction shall be based on the water budget developed pursuant to section A5.304.1.1. Methods used to accomplish the requirements of this section must be designed to the requirements of the *California Building Standards Code* and shall include, but not be limited to, the following: 1. Plant coefficient 2. Irrigation efficiency and distribution uniformity 3. Use of captured rainwater 4. Use of recycled water 5. Water treated for irrigation purposes and conveyed by a water district or public entity		☒
DIVISION 5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY		
Efficient Framing Systems		
A5.404.1 Wood framing. Employ advanced wood framing techniques or OVE, as recommended by the U.S. Department of Energy's Office of Building Technology, State and Community Programs and as permitted by the enforcing agency.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
Material Sources		
A5.405.4 Recycled content. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.		☒
Enhanced Durability and Reduced Maintenance		
A5.406.1.1 Service life. Use materials, equivalent in performance to virgin materials, with postconsumer or preconsumer recycled content value (RCV) for a minimum of 10 percent of the total value, based on estimated cost of materials on the project. Provide documentation as to the respective values.		☒
A5.406.1.3 Recyclability. Select materials that can be reused or recycled at the end of their service life in the project.		☒
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.	☒	
Construction Waste Reduction, Disposal and Recycling		
5.408.1 Construction waste diversion. Establish a construction waste management plan for the diverted materials or meet local construction and demolition waste management ordinance, whichever is more stringent.	☒	
5.408.2 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan for approval by the enforcement agency that: 1. Identifies the materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale. 2. Determines if materials will be sorted on-site or mixed. 3. Identifies diversion facilities where material collected will be taken. 4. Specifies that the amount of materials diverted shall be calculated by weight or volume, but not by both.	☒	
5.408.2.1 Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with Section 5.408.2 Items 1 through 4. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the enforcing agency. **Exception:** Jobsites in areas were there is no mixed construction and demolition debris (C&D) processor or recycling facilities within a feasible haul distance shall meet the requirements as follows: 1. The enforcement agency having jurisdiction shall at its discretion, enforce the waste management plan and make exceptions as deemed necessary.	☒	
5.408.2.2 Isolated jobsites. The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.	☒	
5.408.3 Construction waste reduction of at least 50 percent. Recycle and/or salvage for reuse a minimum of 50 percent of the nonhazardous construction and demolition debris or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.	☒	
A5.408.3.1 Enhanced construction waste reduction. Divert to recycle or salvage nonhazardous construction and demolition debris generated at the site for at least an 80 percent reduction. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
Life Cycle Assessment		
A5.409.1 Materials and system assemblies. Select materials assemblies based on life cycle assessment of their embodied energy and/or green house gas emission potentials.		☒
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 nonhazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals.	☒	
A5.410.3 Commissioning. 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 project requirements. Commissioning shall be performed in accordance with this section by personnel trained and certified in commissioning by a nationally recognized organization. Commissioning requirements shall include as a minimum: 1. Owner's project requirements 2. Basis of design 3. Commissioning measures shown in the construction documents 4. Commissioning plan 5. Functional performance testing 6. Postconstruction documentation and training 7. Commissioning report All building systems and components covered by Title 24, Part 6, as well as process equipment and controls and renewable energy systems shall be included in the scope of the Commissioning Requirements.		☒
A5.410.3.1 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. At a minimum, this documentation shall include the following: 1. Environmental and sustainability goals 2. Energy efficiency goals 3. Indoor environmental quality requirements 4. Equipment and systems expectations 5. Building occupant and O&M personnel expectations		☒
A5.410.3.2 Basis of Design (BOD). A written explanation of how the design of the building systems meets the owner's project requirements shall be completed at the design phase of the building project and updated as necessary during the design and construction phases. At a minimum, the basis of design document shall cover the following systems: 1. Heating, ventilation, air conditioning (HVAC) systems and controls 2. Indoor lighting system and controls 3. Water heating system 4. Renewable energy systems		☒
A5.410.3.3 Commissioning plan. A commissioning plan shall be completed to document how the project will be commissioned and shall be started during the design phase of the building project. The commissioning plan shall include the following at a minimum: 1. General project information 2. Commissioning Goals 3. Systems to be commissioned. Plans to test systems and components shall include at a minimum: a. A detailed 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 requirements listed in Sections A5.410.3.4 through A5.410.3.6 shall be included.		☒
A5.410.3.4 Functional performance testing. 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.		☒
A5.410.3.5 Documentation and training. A systems manual and systems operations training are required.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
A5.410.3.5.1 Systems manual. Documentation of the operational aspects of the building shall be completed within the systems manual and delivered to the building owner and facilities operator. At a minimum, 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		☒
A5.410.3.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall include, as a minimum, the following: 1. System/equipment overview (what it is, what it does and what other systems and/or equipment it interfaces with) 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		☒
A5.410.3.6 Commissioning report. A complete report of commissioning process activities undertaken through the design and construction and reporting recommendations for post-construction phases of the building project shall be completed and provided to the owner.		☒
A5.410.4 Testing and adjusting. Testing and adjusting systems shall be required for buildings less than 10,000 square feet.		☒
A5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include at a minimum, as applicable to the project: 1. HVAC systems and controls 2. Indoor and outdoor lighting and controls 3. Water heating systems 4. Renewable energy system		☒
A5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with industry best practices and applicable national standards on each system.		☒
A5.410.4.3.1 HVAC balancing. In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; or Associated Air Balance Council National Standards.		☒
A5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.		☒
A5.410.4.5 Operation and maintenance manual. Provide the building owner with detailed operating and maintenance instructions and copies of guaranties/warranties for each system prior to final inspection.		☒
DIVISION 5.5 – ENVIRONMENTAL QUALITY		
Pollutant Control		
A5.504.1.1 Temporary ventilation. Provide temporary ventilation during construction in accordance with Section 121 (Requirements For Ventilation) of the *California Energy Code,* CCR, Title 24, Part 6 and Chapter 4 of CCR, Title 8 and as follows: 1. Ventilation during construction shall be achieved through openings in the building shell using fans to produce a minimum of three air changes per hour. 2. During dust-producing operations, protect supply and return HVAC system openings from dust. 3. The permanent HVAC system shall only be used during construction if necessary to condition the building within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999 or an average efficiency of 30 percent based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy. 4. If the building is occupied during demolition or construction, meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
A5.504.1.2 Additional IAQ measures. Employ additional measures as follows: 1. When using generators to generate temporary power, use generators meeting the requirements of CCR, Title 13, Chapter 9 or local ordinance, whichever is more stringent. 2. Protect on-site absorbent materials from moisture. Remove and replace any materials with evidence of mold, mildew or moisture infiltration. 3. Store odorous and high VOC-emitting materials off-site, without packaging, for a sufficient period to allow odors and VOCs to disperse. 4. When possible, once materials are on the jobsite, install odorous and high VOC-emitting materials prior to those that are porous or fibrous. 5. Clean oil and dust from ducts prior to use.		☒
A5.504.2 IAQ postconstruction. After all interior finishes have been installed, flush out the building by supplying continuous ventilation with all air handling units at their maximum outdoor air rate and all supply fans at their maximum position and rate for at least 14 days. 1. During this time, maintain an internal temperature of at least 60°F and relative humidity no higher than 60 percent. If extenuating circumstances make these temperature and humidity limits unachievable, the flush out may be conducted under conditions as close as possible to these limits, provided that documentation of the extenuating circumstances is provided in writing. 2. Occupancy may start after 4 days, provided flush out continues for the full 14 days. During occupied times, the thermal comfort conditions of Title 24 must be met. 3. For buildings that rely on natural ventilation, exhaust fans and floor fans must be used to improve air mixing and removal during the 14-day flush out and windows should remain open. 4. Do not "bake out" the building by increasing the temperature of the space. 5. (If continuous ventilation is not possible, flush out air volume must total the equivalent of 14 days of maximum outdoor air.) The air volumes for each period are then calculated and summed and the flush out continues until the total equals the target air volume.		☒
5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation or during storage on the construction site and until final startup of the heating and cooling equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheet metal or other methods acceptable to the enforcing agency to reduce the amount of dust or debris which may collect in the system.	☒	
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 AND SEALANT VOC LIMIT1	☒	
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 Product-Weighted MIR Limits for ROC in section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances, in Sections 94522(c)(2) and (d)(2) of *California Code of Regulations,* Title 17, commencing with Section 94520; and in areas under the jurisdiction of the Bay Area Air Quality Management District additionally comply with the percent VOC by weight of product limits of Regulation 8 Rule 49. TABLE 5.504.4.3 – VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS2, 3	☒	
5.504.4.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of the following: 1. Carpet and Rug Institute's Green Label Plus program 2. California Department of Public Health Standard Practice for the testing of VOCs (Specification 01350) 3. NSF/ANSI 140 at the Gold level 4. Scientific certifications systems sustainable choice	☒	

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒
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 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 for Composite Wood (17 CCR 93120 et seq.), by or before the dates specified in those sections. TABLE 5.504.4.5 – FORMALDEHYDE LIMITS	☒	
A5.504.4.5.1 Early compliance with formaldehyde limits. Where complying composite wood product is readily available for nonresidential occupancies, meet requirements before the compliance dates indicated in Table 5.504.4.5, or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins.		☒
5.504.4.6 Resilient flooring systems. For 50 percent of floor area receiving resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List or certified under the Resilient Floor Covering Institute (RFCI) Floor Score program. Documentation shall be provided that verifies that finish materials are certified to meet the pollutant emission limits.	☒	
A5.504.4.7 Resilient flooring systems. For 80 percent of floor area to schedule to receive resilient flooring, install resilient flooring complying with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List or certified under the FloorScore program of the Resilient Floor Covering Institute.		☒
A5.504.4.8 Thermal insulation. Comply with Chapter 12-13 (Standards For Insulating Material) in Title 24, Part 12, the *California Referenced Standards Code and* with the VOC-emission limits defined in the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List. Documentation shall be provided that verifies that finish materials are certified to meet the pollutant emission limits.		☒
A5.504.4.8.1.1 Thermal insulation, No-Added Formaldehyde. Install No-Added Formaldehyde thermal insulation in addition to meeting the 2009 Collaborative for High Performance Schools (CHPS) criteria and listed on its Low-emitting Materials List.		☒
A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2, the *California Building Code* and with the VOC-emission limits defined in the 2009 Collaborative for High Performances Schools (CHPS) criteria and listed on its Low-emitting Materials List.		☒
A5.504.5 Hazardous particulates and chemical pollutants. Minimize and control pollutant entry into buildings and cross-contamination of regularly occupied areas.		☒
A5.504.5.1 Entryway systems. Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors. 1. Qualifying entryways are those that serve as regular entry points for building users. 2. Acceptable entryway systems include, but are not limited to, permanently installed grates, grilles or slotted systems that allow cleaning underneath. 3. Roll-out mats are acceptable only when maintained regularly by janitorial contractors as documented in service contract or by in-house staff as documented by written policies and procedures.		☒
A5.504.5.2 Isolation of pollutant sources. In rooms where activities produce hazardous fumes or chemicals, such as garages, janitorial or laundry rooms and copy or printing rooms, exhaust them and isolate them from their adjacent rooms. 1. Exhaust each space with no air recirculation in accordance with ASHRAE 62.1, Table 6-4 to create negative pressure with respect to adjacent spaces with the doors to the room closed. 2. For each space, provide self-closing doors and deck to deck partitions or a hard ceiling. 3. Install low-noise, vented range hoods for all cooking appliances and in laboratory or other chemical mixing areas.		☒
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 prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 8.	☒	
A5.504.5.3.1 Filters. In mechanically ventilated buildings, provide regularly student occupied areas of the building with air filtration media for outside and return air prior to occupancy that provides at least a Minimum Efficiency Reporting Value (MERV) of 11.		☒

continued

APPLICATION CHECKLIST DSA-SS	MANDATORY ☒	VOLUNTARY ☒	
Indoor Moisture Control			
5.505. 1 Indoor moisture control. Buildings shall meet or exceed the provisions of *California Building Code,* CCR, Title 24, Section 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.	☒		
Indoor Air Quality			
5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 121 (Requirements For Ventilation) of the *California Energy Code,* CCR, Title 24, Part 6 or the applicable local code, whichever is more stringent and Chapter 4 of CCR, Title 8.	☒		
Environmental Comfort			
A5.507.1 Lighting and thermal comfort controls. Provide controls in the workplace as described in Sections A5.507.1.1 and A5.507.1.2.		☒	
A5.507.1.1 Single-occupant spaces. Provide individual controls that meet energy use requirements in the 2007 *California Energy Code* in accordance with Sections A5.507.1.1.1 and A5.507.1.1.2.		☒	
A5.507.1.1.1 Lighting. Provide individual task lighting and/or day lighting controls for at least 90 percent of the building occupants.		☒	
A5.507.1.1.2 Thermal comfort. Provide individual thermal comfort controls for at least 50 percent of the building occupants. 1. Occupants shall have control over at least one of the factors of air temperature, radiant temperature, air speed and humidity as described in ASHRAE 55-2004. 2. Occupants inside 20 feet of the plane of and within 10 feet either side of operable windows can substitute windows to control thermal comfort. The areas of operable window must meet the requirements of Section 121 (Requirements For Ventilation) of the *California Energy Code.*		☒	
A5.507.1.2 Multi-occupant spaces. Provide lighting and thermal comfort system controls for all shared multi-occupant spaces, such as classrooms and conference rooms.		☒	
A5.507.2 Daylight. Provide day lit spaces as required for top lighting and side lighting in the 2007 *California Energy Code.* In constructing a design, consider the following: 1. Use of light shelves and reflective room surfaces to maximize daylight penetrating the rooms 2. Means to eliminate glare and direct sun light, including through skylights 3. Use of photo sensors to turn off electric lighting when daylight is sufficient 4. Not using diffuse day lighting glazing where views are desired		☒	
A5.507.3 Views. Achieve direct line of sight to the outdoor environment via vision glazing between 2' 6" and 7' 6" above finish floor for building occupants in 90 percent of all regularly occupied areas as demonstrated by plan view and section cut diagrams.		☒	
A5.507.3.1 Interior office spaces. Entire areas of interior office spaces may be included in the calculation if at least 75 percent of each area has direct line of sight to perimeter vision glazing.		☒	
A5.507.3.2 Multi-occupant spaces. Include in the calculation the square footage with direct line of sight to perimeter vision glazing. **Exceptions to Sections A5.507.2 and A5.507.3:** Copy/printing rooms, storage areas, mechanical spaces, restrooms, auditoria and other intermittently or infrequently occupied spaces or spaces where daylight would interfere with use of the space.		☒	
A5.507.5 Acoustical control. Public Schools and Community Colleges: Unoccupied, furnished classrooms must have a maximum background noise level of no more than 45 dBA LAeq and a maximum (unoccupied, furnished) reverberation of 0.6-second time for classrooms with less than 10,000 cubic feet and a maximum (unoccupied, furnished) reverberation of 0.7-second time for classroom volumes with between 10,000 cubic feet and 20,000 cubic feet.		☒	
Outdoor Air Quality			
5.508.1 Ozone depletion and global warming 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 CFCs.** Install HVAC and refrigeration equipment that does not contain CFCs. **5.508.1.2 Halons.** Install fire suppression equipment that does not contain Halons.	 ☒ ☒		

NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST [OSHPD 1, 2 and 4]				
	COMPLIANCE LEVELS			
		VOLUNTARY *CALGreen*		
FEATURE OR MEASURE	MANDATORY *CALGreen*	Tier 1	Tier 2	NOTES
DIVISION A5.1 – PLANNING AND DESIGN				
SECTION Site Development				
A5.106.9 Building orientation. Locate and orient the building as follows: 1. Long sides facing north and south. 2. Protect the building from thermal loss, drafts and degradation of the building envelope caused by wind and wind-driven materials.		☐	☐	
DIVISION A5.2 – ENERGY EFFICIENCY				
SECTION A5.203 Performance Measures				
A5.203.1 Energy performance. [OSHPD 1] **A5.203.1.1 CALGreen Tier 1. [OSHPD 1]** Buildings must comply with the latest edition of "Savings By Design, Healthcare Modeling Procedures." **A.5.203.1.2 CALGreen Tier 2. [OSHPD 1]** Buildings must exceed the latest edition of "Savings By Design, Healthcare Modeling Procedures" by 15 percent.		☐	☐	
SECTION A5.204 Prescriptive Measures				
A5.204.1 ENERGY STAR equipment and appliances. All equipment and appliances provided by the builder shall be ENERGY STAR labeled if ENERGY STAR is applicable to that equipment or appliance.		☐	☐	
A5.204.4 Commissioning. Building commissioning for all building systems covered by T24, Part 6, process systems and renewable energy systems shall be included in the design and construction processes of the building project. Commissioning requirements shall include as a minimum items listed in Section A5.204.4.		☐	☐	
A5.204.4.1 Owner's Project Requirements (OPR). Documented before the design phase of the project begins the OPR shall include items listed in Section A5.204.4.		☐	☐	
A5.204.4.2 Basis of Design (BOD). 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 and updated periodically to cover the systems listed in Section A5.204.4.2.		☐	☐	
A5.204.4.3 Commissioning plan. A commissioning plan describing how the project will be commissioned shall be started during the design phase of the building project and shall include as a minimum items listed in Section A5.204.4.3.		☐	☐	
A5.204.4.4 Functional performance testing shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications.		☐	☐	
A5.204.4.5 Post construction documentation and training. A systems manual and systems operations training are required.		☐	☐	
A5.204.4.5.1 Systems manual. The systems manual shall be delivered to the building owner and facilities operator and shall include the items listed in Section A5.204.4.5.1.		☐	☐	
A5.204.4.5.2 Systems operations training. The training of the appropriate maintenance staff for each equipment type and/or system shall include as a minimum items listed in Section A5.204.4.5.2.		☐	☐	
A5.204.4.6 Commissioning report. A complete report of commissioning process activities undertaken through the design, construction and postconstruction phases of the building project shall be completed and provided to the owner.		☐	☐	
A5.204.6 Building orientation and shading. Locate orient and shade the building as required in Section A5.106.11.		☐	☐	
SECTION A5.205 Building Envelope				
A5.205.1 Fenestration products and exterior doors. **A5.205.1.1 Certification of fenestration products and exterior door other than field-fabricated.**		☐	☐	
A5.205.1.2 Installation of field-fabricated fenestration and exterior doors.		☐	☐	
A5.205.2 Joints and other openings.		☐	☐	
A5.205.3 Installation and roofing products.		☐	☐	

continued

NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST [OSHPD 1, 2 and 4]				
	COMPLIANCE LEVELS			
	MANDATORY *CALGreen*	VOLUNTARY *CALGreen*		
FEATURE OR MEASURE		Tier 1	Tier 2	NOTES
SECTION A5.207 HVAC Design, Equipment and Installation				
A5.207.1 Space-conditioning equipment certification by manufacturers.		☐	☐	
A5.207.1.1 Efficiency.		☐	☐	
A5.207.1.2 Controls for heat pumps with supplementary electric resistance heaters.		☐	☐	
A5.207.1.3 Thermostats.		☐	☐	
A5.207.1.4 Gas-and oil-fired furnace standby loss controls.		☐	☐	
A5.207.2 Space conditioning systems.		☐	☐	
A5.207.2.1 Supply air temperature reset controls.		☐	☐	
A5.207.2.2 Electric resistance heating.		☐	☐	
A5.207.2.3 Heat rejection systems.		☐	☐	
A5.207.2.4 Hydronic system measures.		☐	☐	
A5.207.2.5 Air distribution system duct leakage sealing.		☐	☐	
A5.207.2.6 Variable air volume control for single zone systems.		☐	☐	
A5.207.3 Service water-heating systems and equipment.		☐	☐	
A5.207.3.1 Certification by manufacturers.		☐	☐	
A5.207.3.2 Efficiency.		☐	☐	
A5.207.3.3 Installation.		☐	☐	
A5.207.4 Natural gas central furnaces, cooking equipment and pool and spa heaters: Pilot lights prohibited.		☐	☐	
A5.207.5 Controls for space-conditioning systems.		☐	☐	
A5.207.5.1 Thermostatic controls for each zone.		☐	☐	
A5.207.5.2 Criteria for zonal thermostatic controls.		☐	☐	
A5.207.5.3 Heat pump controls.		☐	☐	
A5.207.5.4 Dampers for air supply and exhaust equipment.		☐	☐	
A5.207.5.5 Automatic demand shed controls.		☐	☐	
A5.207.6 Pipe insulation.		☐	☐	
SECTION A5.209 Lighting				
A5.209.1 Lighting control devices, ballasts and luminaires.		☐	☐	
A5.209.1.1 All devices: Instructions and calibration.		☐	☐	
A5.209.1.2 Indicator lights.		☐	☐	
A5.209.1.3 Automatic time switch control devices.		☐	☐	
A5.209.1.4 Occupant sensors, motion sensors and vacancy sensors.		☐	☐	
A5.209.1.5 Multilevel occupant sensor.		☐	☐	
A5.209.1.6 Automatic daylighting control devices.		☐	☐	
A5.209.1.7 Interior Photosensors.		☐	☐	
A5.209.1.8 Multilevel astronomical time-switch controls.		☐	☐	
A5.209.1.9 Outdoor astromomical time-switch controls.		☐	☐	
A5.209.1.10 Dimmers.		☐	☐	
A5.209.2 Indoor lighting controls.		☐	☐	
A5.209.2.1 Area controls.		☐	☐	
A5.209.2.2 Multilevel lighting controls.		☐	☐	
A5.209.2.3 Daylight areas.		☐	☐	
A5.209.2.3.1 Daylight area.		☐	☐	
A5.209.2.3.1.2 Daylight area, primary sidelit.		☐	☐	
A5.209.2.3.1.3 Daylight area, secondary sidelit.		☐	☐	
A5.209.2.3.1.4 Daylight area, skylit.		☐	☐	
A5.209.2.3.2 Controls for luminaires providing general lighting that are in or are partially in the skylit daylight area and or the primary sidelit daylight area.		☐	☐	
A5.209.2.4 Shut-off controls.		☐	☐	
A5.209.3 Outdoor lighting controls and equipment.		☐	☐	
A5.209.3.1 Outdoor lighting.		☐	☐	
A5.209.3.2 Luminaire cutoff requirements.		☐	☐	
A5.209.3.3 Controls for outdoor lighting.		☐	☐	

continued

NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST [OSHPD 1, 2 and 4]				
	COMPLIANCE LEVELS			
	MANDATORY *CALGreen*	VOLUNTARY *CALGreen*		
FEATURE OR MEASURE		Tier 1	Tier 2	NOTES
A5.209.4 Outdoor lighting.		☐	☐	
A5.209.4.1 Outdoor lighting power trade-offs.		☐	☐	
A5.209.4.2 Outdoor lighting power.		☐	☐	
A5.209.4.3 Calculation of actual lighting power.		☐	☐	
A5.209.4.4 Calculation of allowed lighting power.		☐	☐	
A5.209.4.4.1 General hardscape lighting allowance.		☐	☐	
A5.209.4.4.2 Additional lighting power allowance for specific applications.		☐	☐	
A5.209.4.4.2.3 Additional lighting power allowance for local ordinance requirements.		☐	☐	
A5.209.5 Signs.		☐	☐	
A5.209.5.1 Maximum allowed lighting power.		☐	☐	
A5.209.5.2 Alternate lighting sources.		☐	☐	
A5.209.6 Sign lighting controls.		☐	☐	
A5.209.7 Nonresidential lighting control acceptance.		☐	☐	
SECTION A5.210 Appliances				
A5.210.1 Appliances regulated by the appliance efficiency regulations.		☐	☐	
DIVISION A5.4 – MATERIAL CONSERVATION AND RESOURCE EFFICIENCY				
SECTION A5.407 Water Resistance and Moisture Management				
A5.407.3 Weather Protection.		☐	☐	
A5.407.4.1 Moisture control.		☐	☐	
A5.407.4.2 Sprinklers.		☐	☐	
A5.407.4.3 Entries and openings.		☐	☐	
SECTION A5.408 Construction Waste Reduction, Disposal and Recycling				
A5.408.5 Construction waste diversion. Establish a construction waste management plan or meet local ordinance, whichever is more stringent.		☐	☐	
A5.408.6 Construction waste. Recycle and/or salvage for reuse a minimum of 50 percent of nonhazardous construction and demolition debris or meet local ordinance, whichever is more stringent. **Exceptions:** 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.		☐	☐	
A5.408.7 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.		☐	☐	
SECTION A5.410 Building Maintenance and Operation				
A5.410.6 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling.		☐	☐	
DIVISION A5.5 – ENVIRONMENTAL QUALITY				
SECTION A5.504 Pollutant Control				
A5.504.4.5.1 Early compliance with formaldehyde limits. Where complying composite wood product is readily available for nonresidential occupancies, meet requirements before the compliance dates indicated in Table A5.504.8.5 (Tier 1) or use composite wood products made with either CARB-approved no-added formaldehyde (NAF) resins or CARB-approved ultra-low emitting formaldehyde (ULEF) resins (Tier 2).		☐	☐	
A5.504.8 Finish material pollutant control. Finish materials shall comply with Sections A5.504.8.1 through A5.504.8.4.		☐	☐	
A5.504.8.1 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 and adhesive primers, sealants and sealant primers shall comply with Table A5.504.8.1.		☐	☐	
2. Aerosol adhesives shall meet the requirements of *California Code of Regulations*, Title 17, commencing with Section 94507, http://ccr.oal.ca.gov/.		☐	☐	

continued

NONRESIDENTIAL OCCUPANCIES APPLICATION CHECKLIST [OSHPD 1, 2 and 4]				
	COMPLIANCE LEVELS			
	MANDATORY *CALGreen*	VOLUNTARY *CALGreen*		
FEATURE OR MEASURE		Tier 1	Tier 2	NOTES
A5.504.8.3 Paints and coatings. Architectural paints and coatings shall comply with Table A5.504.8.3.		☐	☐	
A5.504.8.3.2 Verification.		☐	☐	
A5.504.8.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the standards listed in Section A5.504.8.3.		☐	☐	
A5.504.8.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.		☐	☐	
A5.504.8.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table A5.504.8.1.		☐	☐	
A5.504.8.5 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 Table A5.504.8.		☐	☐	
A5.504.8.5.2 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. Other methods acceptable to the enforcing agency		☐	☐	
A5.504.4.9 Acoustical ceilings and wall panels. Comply with Chapter 8 in Title 24, Part 2 and with the VOC-emission limits defined in the CHPS Low-emitting Materials List.		☐	☐	
A5.504.5 Hazardous particulates and chemical pollutants. Minimize and control pollutant entry into buildings and cross-contamination of regularly occupied areas.		☐	☐	
A5.504.5.1 Entryway systems. Install permanent entryway systems measuring at least six feet in the primary direction of travel to capture dirt and particulates at entryways directly connected to the outdoors as listed in Items 1 through 3 in Section A5.504.5.1.		☐	☐	
A5.504.9 Environmental tobacco smoke (ETS) control. Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows and in buildings; 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.		☐	☐	
SECTION A5.505 Indoor Moisture Control				
A5.505.2 Indoor moisture control. Buildings shall meet or exceed the provisions of *California Building Code*, CCR, Title 24, Part 2, Section 1203 and Chapter 14.		☐	☐	
SECTION A5.507 Environmental Comfort **Reserved**				

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HISTORY NOTE APPENDIX
CALIFORNIA GREEN BUILDING STANDARDS CODE

(Title 24, Part 11, California Code of Regulations)

For prior history, see the History Note Appendix to the *California Green Building Standards Code*, 2008 Edition, effective August 1, 2009.

1. (BSC 03/09, DSA-SS 05/09, HCD 05/09, OSHPD 06/09) Adoption of mandatory and voluntary green building standards by BSC, HCD and DSA-SS and voluntary green building standards by OSHPD, effective on January 1, 2011.

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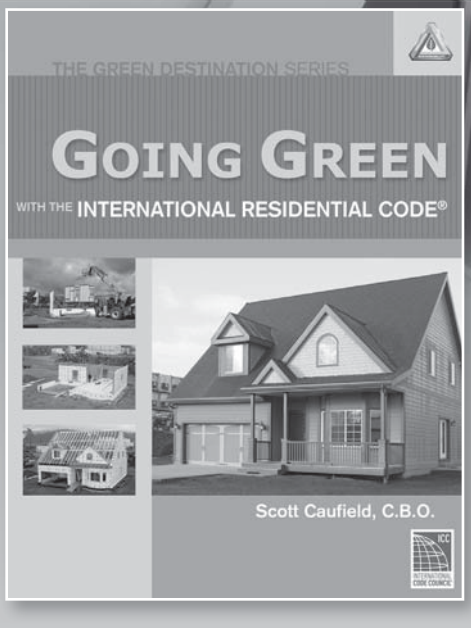

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