

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

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

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

**CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES**

Division 5.1 – PLANNING AND DESIGN

**SECTION 5.101
GENERAL**

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

**SECTION 5.102
DEFINITIONS**

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

CUTOFF LUMINAIRES.

LOW-EMITTING AND FUEL EFFICIENT VEHICLES.

NEIGHBORHOOD ELECTRIC VEHICLE (NEV).

TENANT-OCCUPANTS.

VANPOOL VEHICLE.

ZEV.

**SECTION 5.103
SITE SELECTION
(Reserved)**

**SECTION 5.104
SITE PRESERVATION
(Reserved)**

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

**SECTION 5.106
SITE DEVELOPMENT**

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

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

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

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

- a. Scheduling construction activity.

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

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

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

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

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

5.106.4.1.2 Long-term bicycle parking. For new buildings with over 10 tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking

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

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

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

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

5.106.4.2.1 Short-term bicycle parking. Provide permanently anchored bicycle racks within 200 feet of the student entrance, readily visible to passers-by, for 5 percent of the student population based on the total occupant load of the campus with a minimum of one two-bike capacity rack.

5.106.4.2.2 Long-term bicycle parking. Provide secure bicycle parking for 5 percent of employees, based on the total number of motorized vehicle parking capacity in the staff parking lot, with a minimum of one space. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following:

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

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

TABLE 5.106.5.2

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

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

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

CLEAN AIR/
VANPOOL/EV

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

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

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

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

Exceptions: [N]

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

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

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

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

Exception: Additions and alterations not altering the drainage path.

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

ALLOWABLE RATING	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
Maximum Allowable Backlight Rating³				
Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2
Maximum Allowable Uplight Rating				
For area lighting ⁴	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	U1	U2	U3	U4
Maximum Allowable Glare Rating⁵				
Luminaire greater than 2 MH from property line	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G1

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

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

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

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

**CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES**

Division 5.2 – ENERGY EFFICIENCY

**SECTION 5.201
GENERAL**

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

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

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

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	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												
5.303.3 and subsections							X												
5.303.4, Item 1 only							X												
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 terms are defined in Chapter 2.

GRAYWATER.

MODEL WATER EFFICIENT LANDSCAPE ORDINANCE (MWELO).

POTABLE WATER.

RECYCLED WATER.

SUBMETER.

WATER BUDGET.

**SECTION 5.303
INDOOR WATER USE**

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

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

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

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

5.303.2 Water reduction. Plumbing fixtures shall meet the maximum flow rate values shown in Table 5.303.2.3.

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

5.303.2.1 Areas of addition or alteration. For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.2 and Section 5.303.3 shall apply to new fixtures in additions or areas of alteration to the building.

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

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

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

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

5.303.3.3 Showerheads.

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

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

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

**TABLE 5.303.2.3
WATER REDUCTION FIXTURE FLOW RATES**

FIXTURE TYPE	MAXIMUM FLOW RATE
Kitchen faucets	1.8 gpm @ 60 psi
Wash fountains	1.8 [rim space (in.)/20 gpm @ 60 psi]
Metering faucets	0.20 gallons/cycle
Metering faucets for wash fountains	.20 [rim space (in.)/20 gpm @ 60 psi]

**TABLE 5.303.2.2
WATER USE BASELINE³**

FIXTURE TYPE	BASELINE FLOW RATE	DURATION	DAILY USES	OCCUPANTS ²
Showerheads	2.0 gpm @ 80 psi	5 min.	1	X ^{2a}
Lavatory faucets, nonresidential	0.5 gpm @ 60 psi	.25 min.	3	X
Kitchen faucets	2.2 gpm @ 60 psi	4 min.	1	X ^{2b}
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	1.28 gallons/flush	1 flush	1 male ¹ 3 female	X
Flushometer tank water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	X
Flushometer valve water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	X
Electromechanical hydraulic water closets	1.28 gallons/flush	1 flush	1 male ¹ 3 female	X
Urinals	0.5 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. Refer to Table A, Chapter 4, *California Plumbing Code*, for occupant load factors.

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

b. Nonresidential kitchen faucet use is determined by the occupant load of the area served by the fixture.

3. Use Worksheet WS-1 to calculate baseline water use.

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

- || 1. [BSC, DSA-SS] The installation of water-conserving fixtures (water closets, urinals) meeting the criteria established in Section 5.303.2 or 5.303.3.
- || 2. [BSC] 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 A5.304.8].

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

SECTION 5.304 OUTDOOR WATER USE

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

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

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

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

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

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

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

Adopting agency	BSC	SFM	HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			1	2	1-AC	AC	SS	1	2	3	4								
Adopt entire CA chapter	X																		
Adopt entire chapter as amended (amended sections listed below)																			
Adopt only those sections that are listed below							X												
Chapter/Section																			
5.401.1							X												
5.402.1 Definitions							X												
5.407 and subsections							X												
5.408.1–5.408.3							X												
5.410.1							X												
5.410.1.2							X												

**CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES**

*Division 5.4 – MATERIAL CONSERVATION AND
RESOURCE EFFICIENCY*

**SECTION 5.403
FOUNDATION SYSTEMS
(Reserved)**

**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 5.404
EFFICIENT FRAMING TECHNIQUES
(Reserved)**

**SECTION 5.402
Definitions**

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

ADJUST.

BALANCE.

BUILDING COMMISSIONING.

TEST.

**SECTION 5.405
MATERIAL SOURCES
(Reserved)**

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

**SECTION 5.407
WATER RESISTANCE AND
MOISTURE MANAGEMENT**

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

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

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

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

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

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

5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.

**SECTION 5.408
CONSTRUCTION WASTE REDUCTION,
DISPOSAL AND RECYCLING**

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

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

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

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

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

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

Exceptions to Sections 5.408.1.1 and 5.408.1.2:

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

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

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

Notes:

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

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

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

Notes:

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

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

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

**SECTION 5.410
BUILDING MAINTENANCE AND OPERATION**

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

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

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

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

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

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

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

Exceptions:

1. Dry storage warehouses of any size,

2. Areas under 10,000 square feet used for offices or other conditioned accessory spaces within dry storage warehouses.
3. Tenant improvements under 10,000 square feet as described in Section 303.1.1.
4. Commissioning requirements for energy systems covered by the 2013 *California Energy Code*.

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

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

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

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

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

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

1. General project information.
2. Commissioning goals.
3. Systems to be commissioned. Plans to test systems and components shall include:
 - a. An explanation of the original design intent.
 - b. Equipment and systems to be tested, including the extent of tests.

- c. Functions to be tested.
 - d. Conditions under which the test shall be performed.
 - e. Measurable criteria for acceptable performance.
4. Commissioning team information.
 5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.

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

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

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

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

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

1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).

2. Review and demonstration of servicing/preventive maintenance.
3. Review of the information in the systems manual.
4. Review of the record drawings on the system/equipment.

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

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

5.410.4.1 (Reserved)

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

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

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

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

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

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

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

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

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

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

**CHAPTER 5
NONRESIDENTIAL MANDATORY MEASURES**

Division 5.5 – ENVIRONMENTAL QUALITY

**SECTION 5.501
GENERAL**

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

**SECTION 5.502
DEFINITIONS**

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

ARTERIAL HIGHWAY.

A-WEIGHTED SOUND LEVEL (dBA).

1 BTU/HOUR.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL).

COMPOSITE WOOD PRODUCTS.

DAY-NIGHT AVERAGE SOUND LEVEL (L_{dn}).
 DECIBEL (dB).
 ENERGY EQUIVALENT (NOISE) LEVEL (L_{eq}).
 EXPRESSWAY.
 FREEWAY.

GLOBAL WARMING POTENTIAL (GWP).
 GLOBAL WARMING POTENTIAL VALUE (GWP VALUE).
 HIGH-GWP REFRIGERANT.
 LONG RADIUS ELBOW.
 LOW-GWP REFRIGERANT.
 MERV.
 MAXIMUM INCREMENTAL REACTIVITY (MIR).
 PRODUCT-WEIGHTED MIR (PWMIR).
 PSIG.
 REACTIVE ORGANIC COMPOUND (ROC).
 SCHRADER ACCESS VALVES.
 SHORT RADIUS ELBOW.
 SUPERMARKET.
 VOC.

**SECTION 5.503
 FIREPLACES**

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

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

**SECTION 5.504
 POLLUTANT CONTROL**

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

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

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

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

**TABLE 5.504.4.1
 ADHESIVE VOC LIMIT^{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>.

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

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

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

SEALANTS	CURRENT VOC LIMIT
Architectural	250
Marine deck	760
Nonmembrane roof	300
Roadway	250
Single-ply roof membrane	450
Other	420
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.

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

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

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

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

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

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

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

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

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

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

5.504.4.5.1 Early compliance. Reserved.

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

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

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

**TABLE 5.504.4.5
FORMALDEHYDE LIMITS¹
Maximum Formaldehyde Emissions in Parts per Million.**

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

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

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

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

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

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

value shall be included in the operation and maintenance manual.

Exceptions:

1. An ASHRAE 10-percent to 15-percent efficiency filter shall be permitted for an HVAC unit meeting the 2013 *California Energy Code* having 60,000 Btu/h or less capacity per fan coil, if the energy use of the air delivery system is 0.4 W/cfm or less at design air flow.
2. Existing mechanical equipment.

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

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

SECTION 5.505 INDOOR MOISTURE CONTROL

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

SECTION 5.506 INDOOR AIR QUALITY

5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the 2013 *California Energy Code*, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.

5.506.2 Carbon dioxide (CO₂) monitoring. For buildings or additions equipped with demand control ventilation, CO₂ sensors and ventilation controls shall be specified and installed in accordance with the requirements of the 2013 *California Energy Code*, Section 120(c)(4).

SECTION 5.507 ENVIRONMENTAL COMFORT

5.507.4 Acoustical control. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332, using either the pre-

scriptive or performance method in Section 5.507.4.1 or 5.507.4.2.

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

Exception: [DSA-SS] For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.

5.507.4.1 Exterior noise transmission, prescriptive method. Wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 in the following locations:

1. Within the 65 CNEL noise contour of an airport.

Exceptions:

1. L_{dn} or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.
2. L_{dn} or CNEL for other airports and heliports for which a land use plan has not been developed shall be determined by the local general plan noise element.
2. Within the 65 CNEL or L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.

5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB L_{eq}-1-hr during any hour of operation shall have building, addition or alteration exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30).

5.507.4.2 Performance method. For buildings located as defined in Section 5.507.4.1 or 5.507.4.1.1, wall and roof-ceiling assemblies exposed to the noise source making up the building or addition envelope or altered envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (L_{eq}-1Hr) of 50 dBA in occupied areas during any hour of operation.

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

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

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

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

SECTION 5.508 OUTDOOR AIR QUALITY

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

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

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

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

Exception: Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO₂), and potentially other refrigerants.

5.508.2.1 Refrigerant piping. Piping compliant with the *California Mechanical Code* shall be installed to be accessible for leak protection and repairs. Piping runs using threaded pipe, copper tubing with an outside diameter (OD) less than 1/4 inch, flared tubing connections and short radius elbows shall not be used in refrigerant systems except as noted below.

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

5.508.2.1.2 Copper pipe. Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.

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

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

Exception: Single-flared tubing connections may be used with a multiring seal coated with industrial seal-

ant suitable for use with refrigerants and tightened in accordance with manufacturer's recommendations.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

