



Sunnyvale

# CALGREEN COMMERCIAL MANDATORY CHECKLIST

THESE REQUIREMENTS APPLY TO BUILDING PERMITS SUBMITTED ON OR AFTER JANUARY 1, 2023

Following is a standardized checklist of the 2022 California Green Building Standards Code (CalGreen) requirements that may be used to demonstrate compliance with the CalGreen Mandatory Measures (Chapter 5). This checklist is required for all new buildings, additions of 1,000 square feet or more, and alterations with a permit valuation of \$200,000 and more. Code sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

Description	Designer's Comments with Plan Sheet Reference
<b>5.1 Planning and Design</b>	
<b>5.106.1 Stormwater pollution prevention for projects that disturb &lt; 1 acre of land.</b> Newly constructed projects and additions which disturb less than one acre of land and are not part of a larger common plan of development or sale shall prevent the pollution of stormwater runoff from the construction activities through local ordinance in Section 5.106.1.1 or Best Management Practices (BMP's) in Section 5.106.1.2.	Sheet:
<b>5.106.2 Stormwater pollution prevention for projects that disturb ≥ 1 acres of land.</b> Comply with all lawfully enacted stormwater discharge regulations for projects that disturb one acre or more of land, or disturb less than one acre of land but are part of a larger common plan of development or sale.	Sheet:
<b>5.106.4.1.1 Short-term bicycle parking.</b> 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% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack. <b>Exception:</b> Additions or alterations which add nine or less visitor vehicular parking spaces. <b>5.106.4.1.2 Long-term bicycle parking.</b> For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility. <b>5.106.4.1.3.</b> For additions or alterations that add 10 or more tenant-occupant vehicular parking spaces, provide secure bicycle parking for 5 percent of the tenant vehicular parking spaces being added, with a minimum of one bicycle parking facility. <b>5.106.4.1.4.</b> For new shell buildings in phased projects provide secure bicycle parking for 5 percent of the anticipated tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility. <b>5.106.4.1.5.</b> Acceptable bicycle parking facility for Sections 5.106.4.1.2, 5.106.4.1.3 and 5.106.4.1.4 shall be convenient from the street and shall meet one of the following: <ol style="list-style-type: none"> <li>1. Covered, lockable enclosures with permanently anchored racks for bicycles;</li> <li>2. Lockable bicycle rooms with permanently anchored racks; or</li> <li>3. Lockable, permanently anchored bicycle lockers.</li> </ol>	Sheet:
<b>5.106.5.2 Designated parking for clean air vehicles.</b>	

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	3
26–50	6
51–75	9
76–100	12
101–150	18
151–200	21
201 and over	At least 12 percent of total <sup>1</sup>

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

**Note:** Designated parking for clean air vehicles shall count toward the total parking spaces required by the local enforcing agencies.

**5.106.5.2.1 Parking stall marking.**

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

CLEAN AIR/  
VANPOOL/EV

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

**5.106.5.2.2 Clean Air Vehicle Parking Designation**

EVCS qualify as designated parking as described in Section 5.106.5.2 Designated parking for clean air vehicles.

**Notes:**

1. The California Department of Transportation adopts and publishes the California Manual on Uniform Traffic Control Devices (California MUTCD) to provide uniform standards and specifications for all official traffic control devices in California. Zero Emission Vehicle Signs and Pavement Markings can be found in the New Policies & Directives number 13-01. [www.dot.ca.gov/hq/traffops/policy/13-01.pdf](http://www.dot.ca.gov/hq/traffops/policy/13-01.pdf).
2. See Vehicle Code Section 22511 for EV charging spaces signage in offstreet parking facilities and for use of EV charging spaces.
3. The Governor’s Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. [www.opr.ca.gov/docs/ZEV\\_Guidebook.pdf](http://www.opr.ca.gov/docs/ZEV_Guidebook.pdf).
4. Section 11B-812 of the California Building Code requires that a facility providing EVCS for public and common use also provide one or more accessible EVCS as specified in Table 11B-228.3.2.1.
5. It is encouraged that shared parking, EV Ready are designated as “EV preferred.”

**5.106.5.3 Electric vehicle (EV) charging.**

New construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1.

**Exceptions:**

1. Where there is no local utility power supply.

Sheet:

<p>2. Spaces accessible only by automated mechanical car parking systems are excepted from providing EV charging infrastructure.</p> <p><b>5.106.5.3.1 EV Office buildings.</b> In nonresidential new construction buildings designated primarily for office use with parking:</p> <ol style="list-style-type: none"> <li>1. 35% of parking spaces shall be provided with at least one Level 2 EVCS. Calculations for the required minimum number of Level 2 EVCS shall be rounded up to the nearest whole number.</li> <li>2. An additional 35% shall be provided with at least EV Capable.</li> </ol> <p>Calculations for the required minimum number of spaces equipped with Level 2 EVCS and EV Capable spaces shall all be rounded up to the nearest whole number.</p> <p>Construction plans and specifications shall demonstrate that all raceways shall be a minimum of 1" and sufficient for installation of EVCS at all required EV Capable spaces; Electrical calculations shall substantiate the design of the electrical system to include the rating of equipment and any on-site distribution transformers, and have sufficient capacity to simultaneously charge EVs at all required EV spaces including EV Capable spaces; and service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. ALMS may be installed to increase the number of EV chargers or the amperage or voltage beyond the minimum requirements in this code. The option does not allow for installing less electrical panel capacity than would be required without ALMS.</li> </ol>	
<p><b>5.106.5.3.2 Other nonresidential buildings.</b> In nonresidential new construction buildings that are not designated primarily for office use, such as retail or institutional uses:</p> <ol style="list-style-type: none"> <li>1. 35% of the available parking spaces on site shall be equipped with Level 2 EVCS;</li> <li>2. An additional 35% shall be at least EV Capable.</li> <li>3. A Level 3 EVCS (Direct Current Fast Charger) shall be provided for every one hundred (100) spaces on site or fraction thereof.</li> </ol> <p>Calculations for the required minimum number of spaces equipped with Level 2 and Level 3 EVCS and EV Capable shall be rounded up to the nearest whole number.</p> <p><b>Exception:</b> Installation of each Direct Current Fast Charger with the capacity to provide at least 80 kW output may substitute for 6 Level 2 EVCS spaces after a minimum of 6 Level 2 EVCS are installed.</p> <p>Construction plans and specifications shall demonstrate that all raceways shall be a minimum of 1" and sufficient for installation of EVCS at all required EV Capable spaces; Electrical calculations shall substantiate the design of the electrical system to include the rating of equipment and any on-site distribution transformers, and have sufficient capacity to simultaneously charge EVs at all required EV spaces including EV Capable spaces; and service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. ALMS may be installed to increase the number of EV chargers or the amperage or voltage beyond the minimum requirements in this code. The option does not allow for installing less electrical panel capacity than would be required without ALMS.</li> </ol>	Sheet:
<p><b>5.106.5.3.4 Accessible EVCS.</b> When EVSE is installed, accessible EVCS shall be provided in accordance with the California Building Code, Chapter 11B, Section 11B-228.3.</p>	Sheet:
<p><b>5.106.5.4 Electric vehicle (EV) charging: medium-duty and heavy-duty. [N]</b></p>	Sheet:

<p>Construction shall comply with Section 5.106.5.4.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores with planned off-street loading spaces shall also comply with Section 5.106.5.4.1 for future installation of medium- and heavy-duty EVSE.</p> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. On a case-by-case basis where the local enforcing agency has determined compliance with this section is not feasible based upon one of the following conditions: <ol style="list-style-type: none"> <li>a. Where there is no local utility power supply.</li> <li>b. Where the local utility is unable to supply adequate power.</li> <li>c. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 5.106.5.3, may adversely impact the construction cost of the project.</li> </ol> </li> </ol> <p>When EVSE(s) is/are installed, it shall be in accordance with the California Building Code, the California Electrical Code.</p> <p><b>5.106.5.4.1 Electric vehicle charging readiness requirements for warehouses, grocery stores and retail stores with planned off-street loading spaces.</b></p> <p><b>[N]</b> In order to avoid future demolition when adding EV supply and distribution equipment, spare raceway(s) or busway(s) and adequate capacity for transformer(s), service panel(s) or subpanel(s) shall be installed at the time of construction in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:</p> <ol style="list-style-type: none"> <li>1. The transformer, main service equipment and subpanels shall meet the minimum power requirement in Table 5.106.5.4.1 to accommodate the dedicated branch circuits for the future installation of EVSE.</li> <li>2. The construction documents shall indicate one or more location(s) convenient to the planned offstreet loading space(s) reserved for medium- and heavy-duty ZEV charging cabinets and charging dispensers, and a pathway reserved for routing of conduit from the termination of the raceway(s) or busway(s) to the charging cabinet(s) and dispenser(s), as shown in Table 5.106.5.4.1.</li> <li>3. Raceway(s) or busway(s) originating at a main service panel or a subpanel(s) serving the area where potential future medium- and heavy-duty EVSE will be located and shall terminate in close proximity to the potential future location of the charging equipment for medium- and heavy-duty vehicles.</li> <li>4. The raceway(s) or busway(s) shall be of sufficient size to carry the minimum additional system load to the future location of the charging for medium- and heavy-duty ZEVs as shown in Table 5.106.5.4.1.</li> </ol>	
<p><b>5.106.8 Light pollution reduction.</b></p> <p><b>[N]</b> Outdoor lighting systems shall be designed and installed to comply with the following:</p> <ol style="list-style-type: none"> <li>1. The minimum requirements in the California Energy Code for Lighting Zones 0-4 as defined in Chapter 10, Section 10-114 of the California Administrative Code; and</li> <li>2. Backlight (B) ratings as defined in IES TM-15-11 (shown in Table A-1 in Chapter 8);</li> <li>3. Uplight and Glare ratings as defined in California Energy Code (shown in Tables 130.2-A and 130.2-B in Chapter 8) and</li> <li>4. Allowable BUG ratings not exceeding those shown in Table 5.106.8 [N], or</li> </ol> <p>Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.</p> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. Luminaires that qualify as exceptions in Sections 130.2(b) and 140.7 of the California Energy Code.</li> <li>2. Emergency lighting.</li> </ol>	<p>Sheet:</p>

<ol style="list-style-type: none"> <li>3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.</li> <li>4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.</li> <li>5. Luminaires with less than 6,200 initial luminaire lumens.</li> </ol> <p><b>5.106.8.1 Facing – Backlight.</b> Luminaires within 2MH of a property line shall be oriented so that the nearest property line is behind the fixture, and shall comply with the backlight rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point of that property line.</p> <p><b>Exception: Corners.</b> If two property lines (or two segments of the same property line) have equidistant points to the luminaire, then the luminaire may be oriented so that the intersection of the two lines (the corner) is directly behind the luminaire. The luminaire shall still use the distance to the nearest point(s) on the property lines to determine the required backlight rating.</p> <p><b>5.106.8.2 Facing – Glare.</b> For luminaires covered by 5.106.8.1, if a property line also exists within or extends into the front hemisphere within 2MH of the luminaire then the luminaire shall comply with the more stringent glare rating specified in Table 5.106.8 based on the lighting zone and distance to the nearest point on the nearest property line within the front hemisphere.</p>	
<p><b>5.106.10 Grading and paving.</b> Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:</p> <ol style="list-style-type: none"> <li>1. Swales.</li> <li>2. Water collection and disposal systems.</li> <li>3. French drains.</li> <li>4. Water retention gardens.</li> <li>5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.</li> </ol> <p><b>Exception:</b> Additions and alterations not altering the drainage path.</p>	Sheet:

## 5.2 Energy Efficiency

5.201.1 <b>Scope</b> Compliance with the California Energy Commission mandatory standards.	Sheet:
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## 5.3 Water Efficiency and Conservation

<p><b>5.303.1.1 New buildings or additions in excess of 50,000 square feet.</b> Separate submeters shall be installed as follows:</p> <ol style="list-style-type: none"> <li>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.</li> <li>2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystems: <ol style="list-style-type: none"> <li>a. Makeup water for cooling towers where flow through is greater than 500 gpm (30 L/s).</li> <li>b. Makeup water for evaporative coolers greater than 6 gpm (0.04 L/s).</li> <li>c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 kW).</li> </ol> </li> </ol>	Sheet:
<b>5.303.1.2 Excess consumption.</b>	Sheet:

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.	
<b>5.303.3.1 Water closets.</b> 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. <b>Note:</b> The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.	Sheet:
<b>5.303.3.2.1 Wall-mounted urinals.</b> The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush.	Sheet:
<b>5.303.3.2.2 Floor-mounted urinals.</b> The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush.	
<b>5.303.3.3.1 Single showerhead.</b> Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads.	Sheet:
<b>5.303.3.3.2 Multiple showerheads serving one shower.</b> When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time. <b>Note:</b> A hand-held shower shall be considered a showerhead.	
<b>5.303.3.4.1 Nonresidential lavatory faucets.</b> Lavatory faucets shall have a maximum flow rate of not more than 0.5 gallons per minute at 60 psi.	Sheet:
<b>5.303.3.4.2 Kitchen faucets.</b> Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute at 60 psi. Kitchen faucets may temporarily increase the flow above the maximum rate, but not to exceed 2.2 gallons per minute at 60 psi, and must default to a maximum flow rate of 1.8 gallons per minute at 60 psi.	
<b>5.303.3.4.3 Wash fountains.</b> Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute/20 [rim space (inches) at 60 psi].	
<b>5.303.3.4.4 Metering faucets.</b> Metering faucets shall not deliver more than 0.20 gallons per cycle.	
<b>5.303.3.4.5 Metering faucets for wash fountains.</b> Metering faucets for wash fountains shall have a maximum flow rate of not more than 0.20 gallons per cycle/20 [rim space (inches) at 60 psi].	
<b>5.303.3.4.6 Pre-rinse spray valve.</b> When installed, shall meet the requirements in the California Code of Regulations, Title 20 (Appliance Efficiency Regulations), Section 1605.1(h)(4) Table H-2, Section 1605.3(h)(4)(A), and Section 1607(d)(7), and shall be equipped with an integral automatic shutoff.	
<b>5.303.4.1 Food waste disposers.</b> Food waste disposers in commercial buildings are prohibited in City of Sunnyvale.	Sheet:
<b>5.303.5 Areas of addition or alteration.</b> For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Sections 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alteration to the building.	Sheet:
<b>5.303.6 Standards for plumbing fixtures and fittings.</b>	Sheet:

Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet the applicable standards referenced in Table 1701.1 of the California Plumbing Code and in Chapter 6 of this code.	
<p><b>5.304.1 Outdoor potable water use in landscape areas.</b></p> <p>Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. The Model Water Efficient Landscape Ordinance (MWELO) is located in the California Code of Regulations, Title 23, Chapter 2.7, Division 2.</li> <li>2. MWELO and supporting documents, including a water budget calculator, are available at: <a href="https://www.water.ca.gov/">https://www.water.ca.gov/</a>.</li> </ol>	Sheet:

<b>5.4 Material Conservation and Resource Efficiency</b>	
<p><b>5.407.1 Weather protection.</b></p> <p>Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1402.2 (Weather Protection), manufacturer's installation instructions or local ordinance, whichever is more stringent.</p>	Sheet:
<p><b>5.407.2.1 Sprinklers.</b></p> <p>Design and maintain landscape irrigation systems to prevent spray on structures</p>	Sheet:
<p><b>5.407.2.2.1 Exterior door protection.</b></p> <p>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:</p> <ol style="list-style-type: none"> <li>1. An installed awning at least 4 feet in depth.</li> <li>2. The door is protected by a roof overhang at least 4 feet in depth.</li> <li>3. The door is recessed at least 4 feet.</li> <li>4. Other methods which provide equivalent protection.</li> </ol> <p><b>5.407.2.2.2 Flashing.</b></p> <p>Install flashings integrated with a drainage plane.</p>	Sheet:
<p><b>5.408.1 Construction waste management.</b></p> <p>Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste. The City of Sunnyvale requires the use of Green Halo, the Construction and Demolition Waste Management Plan (CDWMP) waste-tracking program to document and monitor compliance.</p>	Sheet:
<p><b>5.408.2 Universal waste.</b></p> <p><b>[A]</b> Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents.</p>	Sheet:
<p><b>5.408.3 Excavated soil and land clearing debris.</b></p> <p>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.</p> <p><b>Exception:</b> Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.</p> <p><b>Notes:</b></p>	Sheet:

<ol style="list-style-type: none"> <li>1. 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. (<a href="http://www.cdfa.ca.gov/exec/county/county_contacts.html">www.cdfa.ca.gov/exec/county/county_contacts.html</a>)</li> <li>2. 2.For a map of known pest and/or disease quarantine zones, consult with the California Department of Food and Agriculture. (<a href="http://www.cdfa.ca.gov">www.cdfa.ca.gov</a>)</li> </ol>	
<p><b>5.410.1 Recycling by occupants.</b> Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste and metals, or meet a lawfully enacted local recycling ordinance, if more restrictive.</p> <p><b>Exception:</b> Rural jurisdictions that meet and apply for the exemption in Public Resources Code 42649.82 (a)(2)(A) et seq. shall also be exempt from the organic waste portion of this section.</p> <p><b>5.410.1.1 Additions.</b> 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.</p> <p><b>Exception:</b> Additions within a tenant space resulting in less than a 30-percent increase in the tenant space floor area.</p> <p><b>5.410.1.2 Sample ordinance.</b> 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).</p>	Sheet:
<p><b>5.410.2 Commissioning.</b> <b>[N] New buildings 10,000 square feet and over.</b> For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner’s or owner representative’s project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated by the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.</p> <p><b>Note:</b> For energy-related systems under the scope (Section 100) of the California Energy Code, including heating, ventilation, air conditioning (HVAC) systems and controls, indoor lighting systems and controls, as well as water heating systems and controls, refer to California Energy Code Section 120.8 for commissioning requirements.</p> <p>Commissioning requirements shall include:</p> <ol style="list-style-type: none"> <li>1. Owner’s or owner representative’s project requirements.</li> <li>2. Basis of design.</li> <li>3. Commissioning measures shown in the construction documents.</li> <li>4. Commissioning plan.</li> <li>5. Functional performance testing.</li> <li>6. Documentation and training.</li> <li>7. Commissioning report.</li> </ol> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. Unconditioned warehouses of any size.</li> <li>2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses.</li> <li>3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1.</li> <li>4. Open parking garages of any size, or open parking garage areas, of any size, within a structure.</li> </ol>	Sheet:



<p><b>Note:</b> For the purposes of this section, unconditioned shall mean a building, area or room which does not provide heating and or air conditioning.</p>	
<p><b>5.410.2.1 Owner's or Owner representative's Project Requirements (OPR).</b>  <b>[N]</b> 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:</p> <ol style="list-style-type: none"> <li>1. Environmental and sustainability goals.</li> <li>2. Building sustainable goals.</li> <li>3. Indoor environmental quality requirements.</li> <li>4. Project program, including facility functions and hours of operation, and need for after hours operation.</li> <li>5. Equipment and systems expectations.</li> <li>6. Building occupant and operation and maintenance (O&amp;M) personnel expectations.</li> </ol>	<p>Sheet:</p>
<p><b>5.410.2.2 Basis of Design (BOD).</b>  <b>[N]</b> 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:</p> <ol style="list-style-type: none"> <li>1. Renewable energy systems.</li> <li>2. Landscape irrigation systems.</li> <li>3. Water reuse systems.</li> </ol>	<p>Sheet:</p>
<p><b>5.410.2.3 Commissioning plan.</b>  <b>[N]</b> 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:</p> <ol style="list-style-type: none"> <li>1. General project information.</li> <li>2. Commissioning goals.</li> <li>3. Systems to be commissioned. Plans to test systems and components shall include: <ol style="list-style-type: none"> <li>a. An explanation of the original design intent.</li> <li>b. Equipment and systems to be tested, including the extent of tests.</li> <li>c. Functions to be tested.</li> <li>d. Conditions under which the test shall be performed.</li> <li>e. Measurable criteria for acceptable performance.</li> </ol> </li> <li>4. Commissioning team information.</li> <li>5. Commissioning process activities, schedules and responsibilities. Plans for the completion of commissioning shall be included.</li> </ol>	<p>Sheet:</p>
<p><b>5.410.2.4 Functional performance testing.</b>  <b>[N]</b> 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.</p>	<p>Sheet:</p>
<p><b>5.410.2.5 Documentation and training.</b>  <b>[N]</b> 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.</p> <p><b>5.410.2.5.1 Systems manual.</b>  <b>[N]</b> 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:</p> <ol style="list-style-type: none"> <li>1. Site information, including facility description, history and current requirements.</li> <li>2. Site contact information.</li> </ol>	<p>Sheet:</p>

<ol style="list-style-type: none"> <li>3. Basic operations and maintenance, including general site operating procedures, basic troubleshooting, recommended maintenance requirements, site events log.</li> <li>4. Major systems.</li> <li>5. Site equipment inventory and maintenance notes.</li> <li>6. A copy of verifications required by the enforcing agency or this code.</li> <li>7. Other resources and documentation, if applicable.</li> </ol> <p><b>5.410.2.5.2 Systems operations training.</b>  <b>[N]</b> 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:</p> <ol style="list-style-type: none"> <li>1. System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).</li> <li>2. Review and demonstration of servicing/preventive maintenance.</li> <li>3. Review of the information in the systems manual.</li> <li>4. Review of the record drawings on the system/equipment.</li> </ol>	
<p><b>5.410.2.6 Commissioning report.</b>  <b>[N]</b> 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.</p>	Sheet:
<p><b>5.410.4 Testing and adjusting. New buildings less than 10,000 square feet.</b>  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.</p> <p><b>5.410.4.2 Systems.</b>  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:</p> <ol style="list-style-type: none"> <li>1. Renewable energy systems.</li> <li>2. Landscape irrigation systems.</li> <li>3. Water reuse systems.</li> </ol> <p><b>5.410.4.3 Procedures.</b>  Perform testing and adjusting procedures in accordance with manufacturer's specifications and applicable standards on each system.</p> <p><b>5.410.4.3.1 HVAC balancing.</b>  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.</p> <p><b>5.410.4.4 Reporting.</b>  After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.</p> <p><b>5.410.4.5 Operation and maintenance (O &amp; M) manual.</b>  Provide the building owner or representative with detailed operating and maintenance instructions and copies of guaranties/warranties for each system. O &amp; M instructions shall be consistent with OSHA requirements in CCR, Title 8, Section 5142, and other related regulations.</p> <p><b>5.410.4.5.1 Inspections and reports.</b>  Include a copy of all inspection verifications and reports required by the enforcing agency.</p>	Sheet:
<p><b>5.5 Environmental Quality</b></p>	
<p><b>5.503.1 Fireplaces.</b>  Install only a direct-vent sealed or pellet stove. Any installed pellet stove shall comply with U.S. EPA New Source Performance Standards (NSPS) emission limits as applicable, and shall have a permanent</p>	Sheet:

label indicating they are certified to meet the emission limits. Pellet stoves and fireplaces shall also comply with applicable local ordinances.	
<b>5.504.1 Temporary ventilation.</b> 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.	Sheet:
<b>5.504.3 Covering of duct openings and protection of mechanical equipment during construction.</b> At the time of rough installation and during storage on the construction site until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.	Sheet:
<b>5.504.4.1 Adhesives, sealants and caulks.</b> Adhesives, sealants and caulks used on the project shall meet the requirements of the following standards: <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol> <b>5.504.4.3 Paints and coatings.</b> 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. <b>5.504.4.3.1 Aerosol paints and coatings.</b> 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. <b>5.504.4.3.2 Verification.</b> 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: <ol style="list-style-type: none"> <li>1. Manufacturer's product specification</li> <li>2. Field verification of on-site product containers</li> </ol>	Sheet:
<b>5.504.4.4 Carpet systems.</b>	Sheet:

<p>All carpet installed in the building interior shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs.</p> <p><b>5.504.4.4.1 Carpet cushion.</b></p> <p>All carpet cushion installed in the building interior shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs.</p> <p><b>5.504.4.4.2 Carpet adhesive.</b></p> <p>All carpet adhesive shall meet the requirements of Table 5.504.4.1.</p>	
<p><b>5.504.4.5 Composite wood products.</b></p> <p>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.</p> <p><b>5.504.4.5.3 Documentation.</b></p> <p>Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following:</p> <ol style="list-style-type: none"> <li>1. Product certifications and specifications.</li> <li>2. Chain of custody certifications.</li> <li>3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.).</li> <li>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.</li> <li>5. Other methods acceptable to the enforcing agency.</li> </ol>	Sheet:
<p><b>5.504.4.6 Resilient flooring systems.</b></p> <p>Where resilient flooring is installed, at least 80 percent of floor area receiving resilient flooring shall meet the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs.</p> <p><b>5.504.4.6.1 Verification of compliance.</b></p> <p>Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.</p>	Sheet:
<p><b>5.504.4.7 Thermal insulation.</b></p> <p>Comply with the requirements of 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 1.2, January 2017 (Emission testing method for California Specification 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs.</p> <p><b>5.504.4.7.1 Verification of compliance.</b></p> <p>Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.</p>	Sheet:
<p><b>5.504.4.8 Acoustical ceilings and wall panels.</b></p> <p>Comply with the requirements of the California Department of Public Health, "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using</p>	Sheet:

<p>Environmental Chambers,” Version 1.2, January 2017 (Emission testing method for California Specification 01350).</p> <p><b>5.504.4.8.1 Verification of compliance.</b></p> <p>Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.</p>	
<p><b>5.504.5.3 Filters.</b></p> <p>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 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.</p> <p><b>Exception:</b> Existing mechanical equipment.</p> <p><b>5.504.5.3.1 Labeling.</b></p> <p>Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.</p>	Sheet:
<p><b>5.504.7 Environmental tobacco smoke (ETS) control.</b></p> <p>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.</p>	Sheet:
<p><b>5.505.1 Indoor moisture control.</b></p> <p>Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1202 (Ventilation) and Chapter 14 (Exterior Walls). For additional measures, see Section 5.407.2 of this code.</p>	Sheet:
<p><b>5.506.1 Outside air delivery.</b></p> <p>For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 (Requirements For Ventilation) of the California Energy Code, or the applicable local code, whichever is more stringent, and Division 1, Chapter 4 of CCR, Title 8.</p> <p><b>5.506.2 Carbon dioxide (CO<sub>2</sub>) monitoring.</b></p> <p>For buildings or additions equipped with demand control ventilation, CO<sub>2</sub> sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, Section 120.1(c)(4).</p>	Sheet:
<p><b>5.507.4 Acoustical control.</b></p> <p>Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E90 and ASTM E413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.</p> <p><b>Exception:</b> 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.</p> <p><b>5.507.4.1 Exterior noise transmission, prescriptive method.</b></p> <p>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:</p> <ol style="list-style-type: none"> <li>1. Within the 65 CNEL noise contour of an airport.</li> </ol> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. L<sub>dn</sub> or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.</li> </ol>	Sheet:

<p>2. <math>L_{dn}</math> 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.</p> <p>2. Within the 65 CNEL or <math>L_{dn}</math> noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway source as determined by the Noise Element of the General Plan.</p> <p><b>5.507.4.1.1 Noise exposure where noise contours are not readily available.</b> Buildings exposed to a noise level of 65 dB <math>L_{eq-1-hr}</math> 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).</p> <p><b>5.507.4.2 Performance method.</b> 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 (<math>L_{eq-1Hr}</math>) of 50 dBA in occupied areas during any hour of operation.</p> <p><b>5.507.4.2.1 Site features.</b> Exterior features such as sound walls or earth berms may be utilized as appropriate to the building, addition or alteration project to mitigate sound migration to the interior.</p> <p><b>5.507.4.2.2 Documentation of compliance.</b> An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.</p> <p><b>5.507.4.3 Interior sound transmission.</b> Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.</p>	
<p><b>5.508.1 Ozone depletion and greenhouse gas reductions.</b> Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.</p> <p><b>5.508.1.1 Chlorofluorocarbons (CFCs).</b> Install HVAC, refrigeration and fire suppression equipment that do not contain CFCs.</p> <p><b>5.508.1.2 Halons.</b> Install HVAC, refrigeration and fire suppression equipment that do not contain Halons.</p>	Sheet:
<p><b>5.508.2 Supermarket refrigerant leak reduction.</b> New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global-warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities. <b>Exception:</b> Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are nonozone-depleting refrigerants that include ammonia, carbon dioxide (CO<sub>2</sub>), and potentially other refrigerants.</p> <p><b>5.508.2.1 Refrigerant piping.</b> 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.</p> <p><b>5.508.2.1.1 Threaded pipe.</b> Threaded connections are permitted at the compressor rack.</p> <p><b>5.508.2.1.2 Copper pipe.</b></p>	Sheet:

Copper tubing with an OD less than  $\frac{1}{4}$  inch may be used in systems with a refrigerant charge of 5 pounds or less.

**5.508.2.1.2.1 Anchorage.**

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

**5.508.2.1.3 Flared tubing connections.**

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

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

**5.508.2.1.4 Elbows.**

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

**5.508.2.2 Valves.**

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

**5.508.2.2.1 Pressure relief valves.**

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

**5.508.2.2.1.1 Pressure detection.**

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

**5.508.2.2.2 Access valves.**

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

**5.508.2.2.2.1 Valve caps.**

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

**5.508.2.2.2.2 Seal caps.**

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

**5.508.2.2.2.2.1 Chain tethers.**

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

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

**5.508.2.3 Refrigerated service cases.**

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

**5.508.2.3.1 Coil coating.**

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

**5.508.2.4 Refrigerant receivers.**

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

**5.508.2.5 Pressure testing.**

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

**5.508.2.5.1 Minimum pressure.**

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

**5.508.2.5.2 Leaks.**

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

**5.508.2.5.3 Allowable pressure change.**

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

**5.508.2.6 Evacuation.**

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

**5.508.2.6.1 First vacuum.**

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

**5.508.2.6.2 Second vacuum.**

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

**5.508.2.6.3 Third vacuum.**

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

Notes:

**[N]** = New construction pursuant to Section 301.3

**[A]** = Additions and/or Alterations pursuant to Section 301.3