

# AIA California 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

## NONRESIDENTIAL MANDATORY MEASURES, SHEET 1 (July 2024 Supplement)

Y	=	YES
N/A	=	NOT APPLICABLE
RESPON. PARTY	=	RESPONSIBLE PARTY (i.e. ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY	CHAPTER 3 GREEN BUILDING SECTION 301 GENERAL
<input type="checkbox"/>	<input type="checkbox"/>		<b>301.1 SCOPE.</b> Buildings shall be designed to include the green building measures specified as mandatory in the application checklists contained in this code. Voluntary green building measures are also included in the application checklists and may be included in the design and construction of structures covered by this code, but are not required unless adopted by a city, county, or city and county as specified in Section 101.7. <b>301.3 NONRESIDENTIAL ADDITIONS AND ALTERATIONS. [BSC-CG]</b> The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of \$200,000 or above (for occupancies within the authority of California Building Standards Commission). 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. <p>A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and/or alterations [A]. When the code section applies to both, no banner will be used.</p> <b>301.3.1 Nonresidential additions and alterations that cause updates to plumbing fixtures only:</b> <b>Note:</b> On and after January 1, 2014, certain commercial real property, as defined in Civil Code Section 1101.3, shall have its noncompliant plumbing fixtures replaced with appropriate water-conserving plumbing fixtures under specific circumstances. See Civil Code Section 1101.1 et seq. for definitions, types of commercial real property affected, effective dates, circumstances necessitating replacement of noncompliant plumbing fixtures, and duties and responsibilities for ensuring compliance. <b>301.3.2 Waste Diversion.</b> The requirements of Section 5.408 shall be required for additions and alterations whenever a permit is required for work. 301.4 PUBLIC SCHOOLS AND COMMUNITY COLLEGES. (see GBCS) 301.5 HEALTH FACILITIES. (see GBCS)
<input type="checkbox"/>	<input type="checkbox"/>		<b>SECTION 302 MIXED OCCUPANCY BUILDINGS</b> <b>302.1 MIXED OCCUPANCY BUILDINGS.</b> In mixed occupancy buildings, each portion of a building shall comply with the specific green building measures applicable to each specific occupancy.
<input type="checkbox"/>	<input type="checkbox"/>		<b>SECTION 303 PHASED PROJECTS</b> <b>303.1 PHASED PROJECTS.</b> For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply. <b>303.1.1 Initial Tenant Improvements.</b> The provisions of this code shall apply only to the initial tenant improvements to a project. Subsequent tenant improvements shall comply with the scoping provisions in Section 301.3 non-residential additions and alterations. <b>ABBREVIATION DEFINITIONS:</b> HCD Department of Housing and Community Development BSC California Building Standards Commission DSA-SS Division of the State Architect, Structural Safety OSHPD Office of Statewide Health Planning and Development LR Low Rise HR High Rise AA Additions and Alterations N New
<input type="checkbox"/>	<input type="checkbox"/>		<b>CHAPTER 5 NONRESIDENTIAL MANDATORY MEASURES</b> <b>DIVISION 5.1 PLANNING AND DESIGN</b> <b>SECTION 5.101 GENERAL</b> <b>5.101.1 SCOPE</b> 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. <b>SECTION 5.102 DEFINITIONS</b> <b>5.102.1 DEFINITIONS</b> The following terms are defined in Chapter 2 ( <i>and are included here for reference</i> ) <b>CUTOFF LUMINAIRES.</b> Luminaires whose light distribution is such that the candela per 1000 lamp lumens does not numerically exceed 25 (2.5 percent) at an angle of 90 degrees above nadir, and 100 (10 percent) at a vertical angle of 80 degrees above nadir. This applies to all lateral angles around the luminaire. <b>ELECTRIC VEHICLE (EV). [BSC-CG, HCD]</b> An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For purposes of the California Electrical Code, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not included. <b>ELECTRIC VEHICLE (EV) CAPABLE SPACE. [BSC-CG, DSA-SS and HCD]</b> A vehicle space with a service panel and load capacity to support a branch circuit and necessary raceways, both underground and/or surface mounted, to support EV charging. <b>ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG, HCD]</b> Off-board charging equipment used to charge an electric vehicle. <b>ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). [HCD]</b> A space intended for future installation of EV charging equipment and charging of electric vehicles. <b>ELECTRIC VEHICLE CHARGING STATION (EVCS). [BSC-CG, DSA-SS, HCD]</b> One or more electric vehicle charging spaces served by EVSE or receptacle(s). <b>ELECTRIC VEHICLE (EV) READY SPACE. [HCD]</b> A vehicle space which is provided with a branch circuit; any necessary raceways, both underground and/or surface mounted, to accommodate EV charging, terminating in a receptacle or a charger. <b>ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). [BSC-CG, DSA-SS and HCD]</b> The conductors, including the ungrounded, grounded and equipment grounding conductors and the electric vehicle connectors, attachment plugs, personnel protection systems, and all other fittings, devices, power outlets or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.
<input type="checkbox"/>	<input type="checkbox"/>		<b>SECTION 5.105 DECONSTRUCTION AND REUSE OF EXISTING STRUCTURES</b> <b>5.105.1 Scope. [BSC-CG]</b> Effective July 1, 2024, alteration(s) to existing building(s) where the combined altered floor area is 100,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 100,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3. Effective January 1, 2026, the combined floor area shall be 50,000 square feet or greater. <b>[DSA-SS]</b> Alteration(s) to existing building(s) where the combined altered floor area is 50,000 square feet or greater shall comply with either Section 5.105.2, 5.409.2, or 5.409.3. Addition(s) to existing building(s) where the total floor area combined with the existing building(s) is 50,000 square feet or greater shall comply with either Section 5.105.2, Section 5.409.2, or Section 5.409.3. <b>Exception [BSC-CG, DSA-SS]:</b> Combined addition(s) to existing building(s) of two times the area or more of the existing building(s) is not eligible to meet compliance with Section 5.105.2. <b>5.105.2 Reuse of existing building.</b> An alteration or addition to an existing building shall maintain at a minimum 45 percent combined of the existing building's primary structural elements (foundations, columns, beams, walls, and floors; and lateral elements) and existing building enclosure (roof framing, wall framing and exterior finishes). Window assemblies, insulation, portions of buildings deemed structurally sound or hazardous, and hazardous materials that are remediated as part of the project shall not be included in the calculation. <b>5.105.2.1 Verification of compliance.</b> Documentation shall be provided in the construction documents to demonstrate compliance with Section 5.105.2. <b>Note:</b> Sample Worksheet WS-3 in Chapter 8 may be used to assist in documenting compliance with this section. <b>5.105.3 Deconstruction (Reserved).</b>

Y	N/A	RESPON. PARTY	SECTION 5.106 SITE DEVELOPMENT
<input type="checkbox"/>	<input type="checkbox"/>		<b>5.106.1 STORM WATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB LESS THAN ONE 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 storm water runoff from the construction activities through one or more of the following measures: <b>5.106.1.1 Local ordinance.</b> Comply with a lawfully enacted storm water management and/or erosion control ordinance. <b>5.106.1.2 Best Management Practices (BMPs).</b> Prevent the loss of soil through wind or water erosion by implementing an effective combination of erosion and sediment control and good housekeeping BMPs. <ol style="list-style-type: none"><li>Soil loss BMPs that should be considered for implementation as appropriate for each project include, but are not limited to, the following:<ol style="list-style-type: none"><li>Scheduling construction activity during dry weather, when possible.</li><li>Preservation of natural features, vegetation, soil, and buffers around surface waters.</li><li>Drainage swales or lined ditches to control stormwater flow.</li><li>Mulching or hydroseeding to stabilize disturbed soils.</li><li>Erosion control to protect slopes.</li><li>Protection of storm drain inlets (gravel bags or catch basin inserts).</li><li>Perimeter sediment control (perimeter silt fence, fiber rolls).</li><li>Sediment trap or sediment basin to retain sediment on site.</li><li>Stabilized construction exits.</li><li>Wind erosion control.</li><li>Other soil loss BMPs acceptable to the enforcing agency.</li></ol></li><li>Good housekeeping BMPs to manage construction equipment, materials, non-stormwater discharges and wastes that should be considered for implementation as appropriate for each project include, but are not limited to, the following:<ol style="list-style-type: none"><li>Dewatering activities.</li><li>Material handling and waste management.</li><li>Building materials stockpile management.</li><li>Management of washout areas (concrete, paints, stucco, etc.).</li><li>Control of vehicle/equipment fueling to contractor's staging area.</li><li>Vehicle and equipment cleaning performed off site.</li><li>Spill prevention and control.</li><li>Other housekeeping BMPs acceptable to the enforcing agency.</li></ol></li></ol>
<input type="checkbox"/>	<input type="checkbox"/>		<b>5.106.2 STORMWATER POLLUTION PREVENTION FOR PROJECTS THAT DISTURB ONE OR MORE ACRES OF LAND.</b> Comply with all lawfully enacted stormwater discharge regulations for projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of a larger common plan of development and sale. <b>Note:</b> Projects that (1) disturb one acre or more of land, or (2) disturb less than one acre of land but are part of the larger common plan of development or sale must comply with the post-construction requirements detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board or the Lahontan Regional Water Quality Control Board (for projects in the Lake Tahoe Hydrologic Unit). The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with the installation of postconstruction stormwater management measures. The NPDES permits emphasize runoff reduction through on-site stormwater use, interception, evapotranspiration, and infiltration through nonstructural controls, such as Low Impact Development (LID) practices, and conversation design measures. Stormwater volume that cannot be addressed using nonstructural practices is required to be captured in structural practices and be approved by the enforcing agency. <b>Note:</b> Refer to the current applicable permits on the State Water Resources Control Board website at: www.waterboards.ca.gov/constructionstormwater. Consideration to the stormwater runoff management measures should be given during the initial design process for appropriate integration into site development. <b>5.106.4 BICYCLE PARKING.</b> 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. <b>5.106.4.1 Bicycle parking. [BSC-CG]</b> Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter. <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 Acceptable bicycle parking facility</b> 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>Covered, lockable enclosures with permanently anchored racks for bicycles;</li><li>Lockable bicycle rooms with permanently anchored racks; or</li><li>Lockable, permanently anchored bicycle lockers.</li></ol> <b>Note:</b> Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates. <b>5.106.4.2 Bicycle parking. [DSA-SS]</b> For public schools and community colleges, comply with Sections 5.106.4.2.1 and 5.106.4.2.2 <b>5.106.4.2.1 Student bicycle parking.</b> Provide permanently anchored bicycle racks conveniently accessed with a minimum of four two-bike capacity racks per new building. <b>5.106.4.2.2 Staff bicycle parking.</b> Provide permanent, secure bicycle parking conveniently accessed with a minimum of two staff bicycle parking spaces per new building. Acceptable bicycle parking facilities shall be convenient from the street or staff parking area and shall meet one of the following: <ol style="list-style-type: none"><li>Covered, lockable enclosures with permanently anchored racks for bicycles;</li><li>Lockable bicycle rooms with permanently anchored racks; or</li><li>Lockable, permanently anchored bicycle lockers.</li></ol> <b>5.106.5.3 Electric vehicle (EV) charging. [N] [BSC-CG]</b> Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1 EV capable spaces, Section 5.106.5.3.2 Electric vehicle charging stations and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 Electric vehicle charging stations (EVCS)—Power allocation method and associated Table 5.106.5.3.6 and shall be provided in accordance with regulations in the <i>California Building Code</i> and the <i>California Electrical Code</i> . <b>Exceptions:</b> <ol style="list-style-type: none"><li>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>Where there is no local utility power supply.</li><li>Where the local utility is unable to supply adequate power.</li><li>Where there is evidence suitable to the local enforcement agency substantiating the 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><li>Parking spaces accessible only by automated mechanical car parking systems are not required to comply with this code section.</li></ol> <b>5.106.5.3.1 EV capable spaces. [N]</b> EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements: <ol style="list-style-type: none"><li>Raceways complying with the California Electrical Code and no less than 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV capable and into a suitable listed cabinet, box enclosure or equivalent. A common raceway may be used to serve multiple EV charging spaces.</li><li>A service panel or subpanel (s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.</li><li>The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.</li><li>The service panel or subpanel circuit directory shall identify the reserved overcurrent protective devices spaces(s) as "EV CAPABLE." The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."</li></ol> <b>Note:</b> A parking space served by electric vehicle supply equipment or designed as a future EV charging space shall count as at least one standard automobile parking space only for the purpose of complying with any applicable minimum parking space requirements established by an enforcement agency. See vehicle Code Section 22511.2 for further details.

Y	N/A	RESPON. PARTY	TABLE 5.106.5.3.1																																																						
<input type="checkbox"/>	<input type="checkbox"/>		<table border="1"><thead><tr><th>TOTAL NUMBER OF ACTUAL PARKING SPACES</th><th>NUMBER OF REQUIRED EV CAPABLE SPACES</th><th>NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)<sup>2</sup></th></tr></thead><tbody><tr><td>0-9</td><td>0</td><td>0</td></tr><tr><td>10-25</td><td>2</td><td>0</td></tr><tr><td>26-50</td><td>8</td><td>2</td></tr><tr><td>51-75</td><td>13</td><td>3</td></tr><tr><td>76-100</td><td>17</td><td>4</td></tr><tr><td>101-150</td><td>25</td><td>6</td></tr><tr><td>151-200</td><td>35</td><td>9</td></tr><tr><td>201 AND OVER</td><td>20 percent of actual parking spaces<sup>1</sup></td><td>25 percent of EV capable spaces<sup>1</sup></td></tr></tbody></table> <ol style="list-style-type: none"><li>Calculation for spaces shall be rounded up to the nearest whole number.</li><li>The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count toward the total number of required EV capable spaces shown in column 2.</li><li>At least one Level 2 EVSE shall be provided.</li></ol> <b>5.106.5.3.2 Electric vehicle charging stations (EVCS)</b> EV capable spaces shall be provided with electric vehicle supply equipment (EVSE) to create EVCS in the number indicated in Table 5.106.5.3.1. The EVCS required by Table 5.106.5.3.1 shall be provided with Level 2 EVSE or DCFG as permitted in Section 5.106.5.3.2.1. At least one Level 2 EVSE shall be provided. One EV charger with multiple connectors capable of charging multiple EVs simultaneously shall be permitted if the electrical load capacity required by Section 5.106.5.3.1 for each EV capable space is accumulatively supplied to the EV charger. The installation of each DCFG EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel. <b>5.106.5.3.2.1</b> The installation of each DCFG EVSE shall be permitted to reduce the minimum number of required EV capable spaces without EVSE or EVCS with Level 2 EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel. <b>5.106.5.3.2.2</b> The installation of two low power Level 2 EV charging receptacles shall be permitted to reduce the minimum number of required EV capable spaces without EVSE in Table 5.106.5.3.1 by one. <b>5.106.5.3.3 Use of automatic load management systems (ALMS).</b> ALMS shall be permitted for EVCS. When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.3.1 for each EVCS may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs. <b>5.106.5.3.4 Accessible EVCS.</b> When EVSE is installed, accessible EVSC shall be provided in accordance with the <i>California Building Code</i> , Chapter 11B, Section 11B-228.3. <b>Note:</b> For EVCS signs, refer to Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s). <b>5.106.5.3.4 Accessible electric vehicle charging station (EVCS).</b> When EVSE is installed, accessible EVCS shall be provided in accordance with the <i>California Building Code</i> , Chapter 11B, Section 11B-228.3. <b>5.106.5.3.5 Electric vehicle charging station signage.</b> Electric vehicle charging stations shall be identified by signage or pavement markings in compliance with Caltrans Traffic Operations Policy Directive 13-01 (Zero Emission Vehicle Signs and Pavement Markings) or its successor(s). Power allocation method shall include the following: <ol style="list-style-type: none"><li>Use any kVA combination of EV capable spaces, low power Level 2, Level 2 or DCFG EVSEs.</li><li>At least one Level 2 EVSE shall be provided.</li></ol> <b>5.106.5.3.6 Electric vehicle charging stations (EVCS)—power allocation method.</b> The power allocation method may be used as an alternative to the requirements in Section 5.106.5.3.1, Section 5.106.5.3.2 and associated Table 5.106.5.3.1. Use Table 5.106.5.3.6 to determine the total power in kVA required based on the total number of actual parking spaces. <b>TABLE 5.106.5.3.6</b> <table border="1"><thead><tr><th>TOTAL NUMBER OF ACTUAL PARKING SPACES</th><th>MINIMUM TOTAL KVA @ 6.6 KVA</th><th>TOTAL KVA REQUIRED IN ANY COMBINATION OF EV CAPABLE, 3,4 LOW POWER LEVEL 2, LEVEL 2, 1, 2 OR DCFG</th></tr></thead><tbody><tr><td>0-9</td><td>0</td><td>0</td></tr><tr><td>10-25</td><td>26.4</td><td>26.4</td></tr><tr><td>26-50</td><td>52.8</td><td>52.8</td></tr><tr><td>51-75</td><td>85.8</td><td>85.8</td></tr><tr><td>76-100</td><td>112.2</td><td>112.2</td></tr><tr><td>101-150</td><td>165</td><td>165</td></tr><tr><td>151-200</td><td>231</td><td>231</td></tr><tr><td>201 AND OVER</td><td>20 percent of actual parking spaces x 6.6</td><td>Total required kVA = P x .20 x 6.6 Where P = Parking spaces in facility</td></tr></tbody></table> <ol style="list-style-type: none"><li>Level 2 EVSE @ 6.6 kVA minimum.</li><li>At least one Level 2 EVSE shall be provided.</li><li>Maximum allowed kVA to be utilized for EV capable spaces is 75 percent.</li><li>If EV capable spaces are utilized, they shall meet the requirements of Section 5.106.5.3.1 EV capable spaces.</li></ol> <b>5.106.5.4 Additions or alterations to existing buildings or parking facilities [A]. [BSC-CG]</b> Existing buildings or parking facilities being modified by one of the following shall comply with Section 5.106.5.4.1 or 5.106.5.4.2. When EVSE is installed, accessible EVCS shall be provided in accordance with the <i>California Building Code</i> , Chapter 11B, Section 11B-228.3. <b>1.</b> When the scope of construction work includes an increase in power supply to an electric service panel as part of a parking facility addition or alteration. <b>2.</b> When a new photovoltaic system is installed covering existing parking spaces. <b>3.</b> When additions or alterations to existing buildings are triggered pursuant to code Section 301.3 and the scope of work includes an increase in power supply to an electric service panel. <b>Exceptions:</b> <ol style="list-style-type: none"><li>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>Where there is no local utility power supply.</li><li>Where the local utility is unable to supply adequate power.</li><li>Where there is evidence suitable to the local enforcement 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><li>Where demonstrated as impracticable excluding local utility service or utility infrastructure issues.</li></ol></li><li>Remote parking facilities that do not have access to the building service panel.</li><li>Parking area lighting upgrades where no trenching is part of the scope of work.</li><li>Emergency repairs, including but not limited to water line break in parking facilities, natural disaster repairs, etc.</li></ol> <b>5.106.5.4.1 Existing buildings or parking areas without previously installed EV capable infrastructure [A].</b> When EV capable infrastructure does not exist at an existing parking facility or building, and the parking facility or building undergoes an addition or alteration listed in Section 5.106.5.4, construction shall include electric vehicle charging in compliance with either Section 5.106.5.3 and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 and associated Table 5.106.5.3.6 utilizing the existing EV capable allocated power and infrastructure for the total number of actual parking spaces being added or altered. If the area being added or altered exceeds the existing EV capable capacity, allocated power and infrastructure, provide additional EV charging as needed to comply with this section. <b>5.106.5.4.2 Existing buildings or parking areas with previously installed EV capable infrastructure [A].</b> When EV capable infrastructure is available at an existing parking facility or building, and the parking facility or building is undergoing an addition or alteration listed in Section 5.106.5.4, construction shall include electric vehicle charging in compliance with either Section 5.106.5.3 and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 and associated Table 5.106.5.3.6 utilizing the existing EV capable allocated power and infrastructure for the total number of actual parking spaces being added or altered. If the area being added or altered exceeds the existing EV capable capacity, allocated power and infrastructure, provide additional EV charging as needed to comply with this section.	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<input type="checkbox"/>	<input type="checkbox"/>		<b>5.106.5.5.1 Electric vehicle (EV) charging; medium-duty and heavy-duty. [N] [BSC-CG]</b> Construction shall comply with Section 5.106.5.5.1 to facilitate future installation of electric vehicle supply equipment (EVSE). Construction for warehouses, grocery stores and retail stores, office buildings, and manufacturing facilities with planned off-street loading spaces shall also comply with Section 5.106.5.5.1 for future installation of medium- and heavy-duty EVSE. <b>Exceptions:</b> <ol style="list-style-type: none"><li>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>Where there is no local utility power supply.</li><li>Where the local utility is unable to supply adequate power.</li><li>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 5.106.5.5.3, may adversely impact the construction cost of the project.</li></ol></li></ol> When EVSE(s) is/are installed, it shall be in accordance with the <i>California Building Code</i> , the <i>California Electrical Code</i> and as follows: <b>5.106.5.5.1.1 Electric vehicle charging readiness requirements for warehouses, grocery stores, office buildings, and manufacturing facilities and retail stores with planned off-street loading spaces. [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 <i>California Electrical Code</i> . Construction plans and specifications shall include, but are not limited to, the following: <ol style="list-style-type: none"><li>The transformer, main service equipment and subpanels shall meet the minimum power requirement in Table 5.106.5.5.1 to accommodate the dedicated branch circuits for the future installation of EVSE.</li><li>The construction documents shall indicate one or more location(s) convenient to the planned off-street 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 5.106.5.5.1.</li><li>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>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 5.106.5.5.1.</li></ol> <b>TABLE 5.106.5.5.1 RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]</b> <table border="1"><thead><tr><th>BUILDING TYPE</th><th>BUILDING SIZE (SQ. FT.)</th><th>NUMBER OF OFF-STREET LOADING SPACES</th><th>ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY &amp; BUSWAY AND TRANSFORMER &amp; PANEL</th></tr></thead><tbody><tr><td rowspan="2">Grocery</td><td>10,000 to 90,000</td><td>1 or 2</td><td>200</td></tr><tr><td>Greater than 90,000</td><td>3 or Greater</td><td>400</td></tr><tr><td rowspan="2">Manufacturing Facilities</td><td>10,000 to 50,000</td><td>1 or 2</td><td>200</td></tr><tr><td>Greater than 50,000</td><td>3 or Greater</td><td>400</td></tr><tr><td rowspan="3">Office Buildings</td><td>10,000 to 135,000</td><td>1 or 2</td><td>200</td></tr><tr><td>10,000 to 135,000</td><td>3 or Greater</td><td>400</td></tr><tr><td>Greater than 135,000</td><td>1 or Greater</td><td>400</td></tr><tr><td rowspan="2">Retail</td><td>10,000 to 135,000</td><td>1 or 2</td><td>200</td></tr><tr><td>Greater than 135,000</td><td>3 or Greater</td><td>400</td></tr><tr><td rowspan="3">Warehouse</td><td>20,000 to 256,000</td><td>1 or 2</td><td>200</td></tr><tr><td rowspan="2">Greater than 256,000</td><td>3 or Greater</td><td>400</td></tr><tr><td>1 or Greater</td><td>400</td></tr></tbody></table> <b>5.106.5.6 Electric vehicle (EV) charging at public schools and community colleges. [DSA-SS]</b> Electric vehicle infrastructure and electric vehicle charging stations shall comply with Section 5.106.5.6 and shall be provided in accordance with regulations in the <i>California Building Code</i> and the <i>California Electrical Code</i> . <b>Exceptions:</b> <ol style="list-style-type: none"><li>On a case-by-case basis where compliance with this section has been demonstrated to be not feasible based upon one of the following conditions, and with concurrence by the Division of the State Architect (DSA), compliance with Section 5.106.5.6 shall not be required.<ol style="list-style-type: none"><li>Where there is no local utility power supply.</li><li>Where the local utility is unable to supply adequate power.</li><li>The installation of EVCS is impracticable.</li></ol></li><li>Parking spaces accessible only by automated mechanical car parking systems are not required to comply with Section 5.106.5.6. <b>5.106.5.6.1 EV capable spaces.</b> EV capable spaces shall be provided in accordance with Table 5.106.5.6.1 and the following requirements:<ol style="list-style-type: none"><li>Raceways complying with the California Electrical Code and no less than 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area and shall terminate in close proximity to the proposed location of the EV capable space and into a suitable listed cabinet, box enclosure or equivalent. A common raceway may be used to serve multiple EV capable spaces.</li><li>A service panel or subpanel(s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV capable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.</li><li>The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.</li><li>The service panel or subpanel circuit directory shall identify the reserved overcurrent protective device space(s) as "EV CAPABLE." The raceway termination location shall be permanently and visibly marked as "EV CAPABLE."</li></ol></li></ol> <b>TABLE 5.106.5.6.1</b> <table border="1"><thead><tr><th>TOTAL NUMBER OF ACTUAL PARKING SPACES</th><th>NUMBER OF REQUIRED EV CAPABLE SPACES</th><th>NUMBER OF REQUIRED EVCS<sup>2</sup></th></tr></thead><tbody><tr><td>0-9</td><td>0</td><td>0</td></tr><tr><td>10-25</td><td>4</td><td>1</td></tr><tr><td>26-50</td><td>8</td><td>2</td></tr><tr><td>51-75</td><td>13</td><td>3</td></tr><tr><td>76-100</td><td>17</td><td>4</td></tr><tr><td>101-150</td><td>25</td><td>6</td></tr><tr><td>151-200</td><td>35</td><td>9</td></tr><tr><td>201 AND OVER</td><td>20 percent of total spaces<sup>1</sup></td><td>25 percent of EV capable spaces<sup>1</sup></td></tr></tbody></table> <ol style="list-style-type: none"><li>Calculation for spaces shall be rounded up to the nearest whole number.</li><li>Each EVCS shall reduce the number of required EV capable spaces by the same number.</li></ol> <b>5.106.5.6.2 Electric vehicle charging stations (EVCS).</b> EV capable spaces shall be provided with EVSE to create EVCS in the number indicated in Table 5.106.5.6.1 and shall comply with Section 5.106.5.6.2. EVCS shall be serviced by Level 2 or Direct Current Fast Charging (DCFC) EVSE, or with EVSE in any combination of Level 2 and DCFC. Accessible EVCS shall be provided in accordance with <i>California Building Code</i> Chapter 11B.	BUILDING TYPE	BUILDING SIZE (SQ. FT.)	NUMBER OF OFF-STREET LOADING SPACES	ADDITIONAL CAPACITY REQUIRED (KVA) FOR RACEWAY & BUSWAY AND TRANSFORMER & PANEL	Grocery	10,000 to 90,000	1 or 2	200	Greater than 90,000	3 or Greater	400	Manufacturing Facilities	10,000 to 50,000	1 or 2	200	Greater than 50,000	3 or Greater	400	Office Buildings	10,000 to 135,000	1 or 2	200	10,000 to 135,000	3 or Greater	400	Greater than 135,000	1 or Greater	400	Retail	10,000 to 135,000	1 or 2	200	Greater than 135,000	3 or Greater	400	Warehouse	20,000 to 256,000	1 or 2	200	Greater than 256,000	3 or Greater	400	1 or Greater	400	TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF REQUIRED EVCS <sup>2</sup>	0-9	0	0	10-25	4	1	26-50	8	2	51-75	13	3	76-100	17	4	101-150	25	6	151-200	35	9	201 AND OVER	20 percent of total spaces <sup>1</sup>	25 percent of EV capable spaces <sup>1</sup>
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# 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE NONRESIDENTIAL MANDATORY MEASURES, SHEET 3 (July 2024 Supplement)

Y = YES APPLICABLE  
N/A = NOT APPLICABLE  
RESPON. PARTY = RESPONSIBLE PARTY (i.e. ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR, ETC.)

Y	N/A	RESPON. PARTY
<input type="checkbox"/>	<input type="checkbox"/>	

Y	N/A	RESPON. PARTY
<input type="checkbox"/>	<input type="checkbox"/>	

Y	N/A	RESPON. PARTY
<input type="checkbox"/>	<input type="checkbox"/>	

Y	N/A	RESPON. PARTY
<input type="checkbox"/>	<input type="checkbox"/>	

**5.409.2 Whole building life cycle assessment.** Projects shall conduct a cradle-to-grave whole building life cycle assessment performed in accordance with ISO 14040 and ISO 14044, excluding operating energy, and demonstrating a minimum 10-percent reduction in global warming potential (GWP) as compared to a reference baseline building of similar size, function, complexity, type of construction, material specification, and location that meets the requirements of the California Energy Code currently in effect. Software used to conduct the whole building life cycle assessment, including reference baseline building, shall have a data set compliant with ISO 14044 and ISO 21930 or EN 15604, and the software shall conform to ISO 21931 and/or EN 15978. The software tools and data sets shall be the same for evaluation of both the baseline building and the proposed building.

- Notes:**
- Software for calculating whole building life cycle assessment is available for free at Athena Sustainable Materials Institute (<https://calculator.com/software/mpact-estimator/>) and OneClick LCA-Planetary ([www.oneclicklca.com/planetary](http://www.oneclicklca.com/planetary)). Paid versions include, but are not limited to, Sphera GaBI Solutions ([gabi.sphera.com](http://gabi.sphera.com)), Simapro ([simapro.com](http://simapro.com)), One-Click LCA ([www.oneclicklca.com](http://www.oneclicklca.com)) and Tally for Revit ([apps.autodesk.com](http://apps.autodesk.com)).
  - ASTM E2921-22 "Standard Practice for Minimum Criteria for Comparing Whole Building Life Cycle Assessments for Use with Building Codes, Standards, and Rating Systems" may be consulted for the assessment.
  - In addition to the required documentation specified in Section 5.409.2.3, Worksheet WS-9 may be required by the enforcing entity to demonstrate compliance with the requirements.
- 5.409.2.1 Building components.** Building enclosure components included in the assessment shall be limited to glazing assemblies, insulation, and exterior finishes. Primary and secondary structural members included in the assessment shall be limited to footings and foundations, and structural columns, beams, walls, roofs, and floors.
- 5.409.2.2 Reference study period.** The reference study period of the proposed building shall be equal to the reference baseline building and shall be 60 years.
- 5.409.2.3 Verification of compliance.** A summary of the GWP analysis produced by the software and Worksheet WS-4 signed by the design professional of record shall be provided in the construction documents as documentation of compliance. A copy of the whole building life cycle assessment which includes the GWP analysis produced by the software, in addition to maintenance and training information, shall be included in the operation and maintenance manual and shall be provided to the owner at the close of construction. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

**5.409.2.3 Verification of compliance.** Calculations to demonstrate compliance. Type III EPDs for products required to comply with the project, and Worksheet WS-5 signed by the design professional of record shall be provided on the construction documents. Updated EPDs for products used in construction shall be provided to the owner at the close of construction and to the enforcement entity upon request. The enforcing agency may require inspection and inspection reports in accordance with Sections 702.2 and 703.1 during and at completion of construction to demonstrate substantial conformance. Inspection shall be performed by the design professional of record or third party acceptable to the enforcing agency.

**SECTION 5.410 BUILDING MAINTENANCE AND OPERATIONS**  
**5.410.1 RECYCLING BY OCCUPANTS.** Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive.

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

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

**Exception:** Additions within a tenant space resulting in less than a 30% 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.

**5.410.4.2 (Reserved)**

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

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

- Renewable energy systems.
- Landscape irrigation systems.
- Water reuse systems.

**SECTION 5.503 FIREPLACES**  
**5.503.1 FIREPLACES.** Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace, or a sealed woodstove or pellet stove, and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150. Woodstoves, pellet stoves and fireplaces shall comply with applicable local ordinances.

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

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

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

- Owner's or Owner representative's project requirements.
- Basis of design.
- Commissioning measures shown in the construction documents.
- Commissioning plan.
- Functional performance testing.
- Documentation and training.
- Commissioning report.

**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 HVAC balancing.** In addition to testing and adjusting, before a new space-conditioning system serving a building or space is operated for normal use, the system shall be balanced in accordance with the procedures defined by the Testing Adjusting and Balancing Bureau National Standards; the National Environmental Balancing Bureau Procedural Standards; 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.

**SECTION 5.504 POLLUTANT CONTROL**  
**5.504.1 TEMPORARY VENTILATION.** The permanent HVAC system shall only be used during construction if necessary to condition the building or areas of addition or alteration within the required temperature range for material and equipment installation. If the HVAC system is used during construction, use return air filters with a Minimum Efficiency Reporting Value (MERV) of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% 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 ventilation equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.

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

**5.410.2.5 Documentation and training. [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:

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

**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 warranties/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.

**5.504.4 FINISH MATERIAL POLLUTANT CONTROL.** Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.

**5.409.3 Product GWP compliance—prescriptive path.** Each product that is permanently installed and listed in Table 5.409.3 shall have a Type III environmental product declaration (EPD), either product-specific or factory-specific.

TABLE 5.409.3 PRODUCT GWP LIMITS

BUY CLEAN CALIFORNIA MATERIALS PRODUCT CATEGORY <sup>1</sup>	MAXIMUM ACCEPTABLE GWP VALUE (unfabricated) (GWP <sub>allowed</sub> )	UNIT OF MEASUREMENT
Hot-rolled structural steel sections	1.77	MT CO <sub>2</sub> e/MT
Hollow structural sections	3.00	MT CO <sub>2</sub> e/MT
Steel plate	2.61	MT CO <sub>2</sub> e/MT
Concrete reinforcing steel	1.56	MT CO <sub>2</sub> e/MT
Flat glass	2.50	MT CO <sub>2</sub> e/MT <sup>4</sup>
Light-density mineral wool board insulation	5.83	kg CO <sub>2</sub> e/MT
Heavy-density mineral wool board insulation	14.28	kg CO <sub>2</sub> e/MT
<b>Concrete, Ready-Mixed<sup>2</sup>, <sup>3</sup></b>		
CONCRETE PRODUCT CATEGORY	MAXIMUM GWP ALLOWED VALUE (GWP <sub>allowed</sub> )	UNIT OF MEASUREMENT
up to 2499 psi	450	kg CO <sub>2</sub> e/m <sup>3</sup>
2500–3499 psi	489	kg CO <sub>2</sub> e/m <sup>3</sup>
3500–4499 psi	566	kg CO <sub>2</sub> e/m <sup>3</sup>
4500–5499 psi	661	kg CO <sub>2</sub> e/m <sup>3</sup>
5500–6499 psi	701	kg CO <sub>2</sub> e/m <sup>3</sup>
6500 psi and greater	799	kg CO <sub>2</sub> e/m <sup>3</sup>
<b>Concrete, Lightweight Ready-Mixed<sup>2</sup></b>		
CONCRETE PRODUCT CATEGORY	MAXIMUM GWP ALLOWED VALUE (GWP <sub>allowed</sub> )	UNIT OF MEASUREMENT
up to 2499 psi	875	kg CO <sub>2</sub> e/m <sup>3</sup>
2500–3499 psi	956	kg CO <sub>2</sub> e/m <sup>3</sup>
3500–4499 psi	1039	kg CO <sub>2</sub> e/m <sup>3</sup>

**Exceptions:**

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

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

**Informational Notes:**

- Functional performance testing for heating, ventilation, air conditioning systems and lighting controls must be performed in compliance with the *California Energy Code*.

**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 (*and are included here for reference*)

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

**A-WEIGHTED SOUND LEVEL (dBA).** The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made.

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

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

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

**Note:** See CCR, Title 17, Section 93120.1.

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

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

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

**ELECTRIC VEHICLE CHARGING STATION(S) (EVCS).** One or more spaces intended for charging electric vehicles.

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

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

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

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

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

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

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

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

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

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

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

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

**PSIG.** Pounds per square inch, gauge.

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

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

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

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

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

**Note:** Where specific regulations are cited from different agencies such as SCAQMD, ARB, etc., the VOC definition included in that specific regulation is the one that prevails for the specific measure in question.

TABLE 5.504.4.1 - ADHESIVE VOC LIMIT<sup>1,2</sup>

ARCHITECTURAL APPLICATIONS	CURRENT VOC LIMIT
INDOOR CARPET ADHESIVES	50
CARPET PAD ADHESIVES	50
OUTDOOR CARPET ADHESIVES	150
WOOD FLOORING ADHESIVES	100
RUBBER FLOOR ADHESIVES	60
SUBFLOOR ADHESIVES	50
CERAMIC TILE ADHESIVES	65
VCT & ASPHALT TILE ADHESIVES	50
DRYWALL & PANEL ADHESIVES	50
COVE BASE ADHESIVES	50
MULTIPURPOSE CONSTRUCTION ADHESIVES	70
STRUCTURAL GLAZING ADHESIVES	100
SINGLE-PLY ROOF MEMBRANE ADHESIVES	250
OTHER ADHESIVES NOT SPECIFICALLY LISTED	50
<b>SPECIALTY APPLICATIONS</b>	
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 & TRIM ADHESIVE	250
<b>SUBSTRATE SPECIFIC APPLICATIONS</b>	
METAL TO METAL	30
PLASTIC FOAMS	50
POROUS MATERIAL (EXCEPT WOOD)	50
WOOD	30
FIBERGLASS	80

- IF AN ADHESIVE IS USED TO BOND DISSIMILAR SUBSTRATES TOGETHER, THE ADHESIVE WITH THE HIGHEST VOC CONTENT SHALL BE ALLOWED.
- FOR ADDITIONAL INFORMATION REGARDING METHODS TO MEASURE THE VOC CONTENT SPECIFIED IN THIS TABLE, SEE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 1168, [www.arb.ca.gov/DRDB/SC/CURHTMLR1168.PDF](http://www.arb.ca.gov/DRDB/SC/CURHTMLR1168.PDF)

TABLE 5.504.4.2 - SEALANT VOC LIMIT

SEALANTS	CURRENT VOC LIMIT
ARCHITECTURAL	250
MARINE DECK	760
NONMEMBRANE ROOF	300
ROADWAY	250
SINGLE-PLY ROOF MEMBRANE	450
OTHER	420
<b>SEALANT PRIMERS</b>	
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.

- The GWP values of the products listed in Table 5.409.3 are based on 175 percent of Buy Clean California Act (BCCA) GWP values, except for concrete products which are not included in the BCCA.
- For concrete, 175 percent of the National Ready Mixed Concrete Association (NRMCA) 2022 version 3 Pacific Southwest regional benchmark values are used for the GWP allowed, except for High Early Strength. Concrete High Early Strength ready-mixed shall be calculated at 130 percent of the ready-mixed concrete GWP allowed values for each product category.
- The GWP unit for flat glass has been adjusted to correct an error in the express terms. With the revised unit (MT CO<sub>2</sub>e/MT), reported GWP values will align with industry data as published in the CLF North American Material Baselines (2023).

**5.409.3.1 Products shall not exceed the maximum GWP value specified in Table 5.409.3.**

**Exception:** Concrete may be considered one product category to meet compliance with this section. A weighted average of the maximum GWP for all concrete mixes installed in the project shall be less than the weighted average maximum GWP allowed per Table 5.409.3 using Exception Equation 5.409.3.1. Calculations shall be performed with consistent units of measurement for the material quantity and the GWP value.

For the purposes of this exception, industry-wide EPDs are acceptable.

**Exception EQUATION 5.409.3.1**

$$GWP_p < GWP_{allowed}$$

where

$$GWP_p = \sum (GWP_n)(V_n)$$

and

$$GWP_{allowed} = \sum (GWP_{allowed})(V_n)$$

and

n = each concrete mix installed in the project  
 mix EPD, in kg CO<sub>2</sub>e/m<sup>3</sup>  
 GWP<sub>allowed</sub> = the GWP potential allowed for concrete mix<sub>n</sub> per Table 5.409.3  
 V<sub>n</sub> = the volume of concrete mix<sub>n</sub> installed in the project, in m<sup>3</sup>

**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:

- System/equipment overview (what it is, what it does and with what other systems and/or equipment it interfaces).
- Review and demonstration of servicing/preventive maintenance.
- Review of the information in the Systems Manual.
- Review of the record drawings on the system/equipment.

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

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



# 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE

## NONRESIDENTIAL MANDATORY MEASURES, SHEET 4 (July 2024 Supplement)

Y = YES  
 N/A = NOT APPLICABLE  
 RESPON. PARTY = RESPONSIBLE PARTY (i.e. ARCHITECT, ENGINEER, OWNER, CONTRACTOR, INSPECTOR ETC.)

Y	N/A	RESPON. PARTY
		<p><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.</p> <p><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.</p>
		<p><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:</p> <ol style="list-style-type: none"> <li>1. Manufacturer's product specification</li> <li>2. Field verification of on-site product containers</li> </ol>
		<p><b>5.504.4.4 Carpet Systems.</b> 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 Specifications 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs. <a href="https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material">https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material</a></p> <p><b>5.504.4.4.1 Carpet cushion.</b> 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 Specifications 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs. <a href="https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material">https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material</a></p> <p><b>5.504.4.4.2 Carpet adhesive.</b> All carpet adhesive shall meet the requirements of Table 5.504.4.1.</p>

TABLE 5.504.4.3 - VOC CONTENT LIMITS FOR ARCHITECTURAL COATINGS<sup>1,2,3</sup>

GRAMS OF VOC PER LITER OF COATING, LESS WATER & LESS EXEMPT COMPOUNDS	
COATING CATEGORY	CURRENT VOC LIMIT
FLAT COATINGS	50
NONFLAT COATINGS	100
NONFLAT HIGH GLOSS COATINGS	150
<b>SPECIALTY COATINGS</b>	
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 <sup>4</sup>	120
MAGNESITE CEMENT COATINGS	450
MASTIC TEXTURE COATINGS	100
METALLIC PIGMENTED COATINGS	500
MULTICOLOR COATINGS	250
PRETREATMENT WASH PRIMERS	420
PRIMERS, SEALERS, & UNDERCOATERS	100
REACTIVE PENETRATING SEALERS	350
RECYCLED COATINGS	250
ROOF COATINGS	50
RUST PREVENTATIVE COATINGS	250
SHELLACS:	
CLEAR	730
OPAQUE	550
SPECIALTY PRIMERS, SEALERS & UNDERCOATERS	100
STAINS	250
STONE CONSOLIDANTS	450
SWIMMING POOL COATINGS	340
TRAFFIC MARKING COATINGS	100
TUB & 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 & 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, FEB. 1, 2008. MORE INFORMATION IS AVAILABLE FROM THE AIR RESOURCES BOARD.

Y	N/A	RESPON. PARTY
		<p><b>5.504.4.5 Composite wood products.</b> Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the buildings 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> 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>
		<p><b>5.504.4.6 Resilient flooring systems.</b> 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 Specifications 01350).</p> <p>See California Department of Public Health's website for certification programs and testing labs. <a href="https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material">https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material</a></p> <p><b>5.504.4.6.1 Verification of compliance.</b> Documentation shall be provided verifying that resilient flooring materials meet the pollutant emission limits.</p> <p><b>5.504.4.7 Thermal insulation</b>        Comply with the requirements of the California Department of Public Health, "Standard Method of 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). See California Department of Public Health's website for certification programs and testing labs. <a href="https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material">https://www.cdph.ca.gov/Programs/CCDPHP/DEODD/EHLB/IAQ/Pages/VOC.aspx#material</a></p> <p><b>5.504.4.7.1 Verification of compliance.</b> Documentation shall be provided verifying that thermal insulation materials meet the pollutant emission limits.</p> <p><b>5.504.4.8 Acoustical ceiling and wall panels.</b> 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). See California Department of Public Health's website for certification programs and testing labs.</p> <p><b>5.504.4.8.1 Verification of compliance.</b> Documentation shall be provided verifying that acoustical finish materials meet the pollutant emission limits.</p> <p><b>5.504.5.3 Filters.</b> 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>Exceptions:</b> Existing mechanical equipment.</p> <p><b>5.504.5.3.1 Labeling.</b> Installed filters shall be clearly labeled by the manufacturer indicating the MERV rating.</p> <p><b>5.504.7 ENVIRONMENTAL TOBACCO SMOKE (ETS) CONTROL.</b> 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>
		<p><b>SECTION 5.505 INDOOR MOISTURE CONTROL</b>  <b>5.505.1 INDOOR MOISTURE CONTROL.</b> 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> <p><b>SECTION 5.506 INDOOR AIR QUALITY</b>  <b>5.506.1 OUTSIDE AIR DELIVERY.</b> 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 6.</p> <p><b>5.506.2 CARBON DIOXIDE (CO<sub>2</sub>) MONITORING.</b> 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(c)(4).</p> <p><b>5.506.3 Carbon dioxide (CO<sub>2</sub>) monitoring in classrooms.</b> (DSA-SS) Each public K-12 school classroom, as listed in Table 120.1-A of the California Energy Code, shall be equipped with a carbon dioxide monitor or sensor that meets the following requirements:</p> <ol style="list-style-type: none"> <li>1. The monitor or sensor shall be permanently affixed in a tamper-proof manner in each classroom between 3 and 6 feet (914 mm and 1829 mm) above the floor and at least 5 feet (1524 mm) away from door and operable windows.</li> <li>2. When the monitor or sensor is not integral to an Energy Management Control System (EMCS), the monitor or sensor shall display the carbon dioxide readings on the device. When the sensor is integral to an EMCS, the carbon dioxide readings shall be available to and regularly monitored by facility personnel.</li> <li>3. A monitor shall provide notification through a visual indicator on the monitor when the carbon dioxide levels in the classroom have exceeded 1,100ppm. A sensor integral to an EMCS shall provide notification to facility personnel through a visual and/or audible indicator when the carbon dioxide levels in the classroom have exceeded 1,100ppm.</li> <li>4. The monitor or sensor shall measure carbon dioxide levels at minimum 15-minute intervals and shall maintain a record of previous carbon dioxide measurements of not less than 30 days duration.</li> <li>5. The monitor or sensor used to measure carbon dioxide levels shall have the capacity to measure carbon dioxide levels with a range of 400ppm to 2000ppm or greater.</li> <li>6. The monitor or sensor shall be certified by the manufacturer to be accurate within 75ppm at 1,000ppm carbon dioxide concentration and shall be certified by the manufacturer to require calibration no more frequently than once every 5 years.</li> </ol>

TABLE 5.504.4.5 - FORMALDEHYDE LIMITS:

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:	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).

Y	N/A	RESPON. PARTY
		<p><b>SECTION 5.507 ENVIRONMENTAL COMFORT</b>  <b>5.507.4 ACOUSTICAL CONTROL.</b> 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 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>Exception: [DSA-SS]</b> For public schools and community colleges, the requirements of this section and all subsections apply only to new construction.</p> <p><b>5.507.4.1 Exterior noise transmission, prescriptive method.</b> 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>eq</sub> or CNEL for military airports shall be determined by the facility Air Installation Compatible Land Use Zone (AICUZ) plan.</li> <li>2. L<sub>eq</sub> 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.</li> </ol> <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 L<sub>eq</sub> - 1hr 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 (Leq-1hr) 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 soundlevels 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>Note:</b> Examples of assemblies and their various STC ratings may be found at the California Office of Noise Control: <a href="http://www.totbase.org/PDF/CaseStudies/stc_icc_ratings.pdf">www.totbase.org/PDF/CaseStudies/stc_icc_ratings.pdf</a>.</p> <p><b>SECTION 5.508 OUTDOOR AIR QUALITY</b>  <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> <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.</p> <p><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> Copper tubing with an OD less than 1/4 inch may be used in systems with a refrigerant charge of 5 pounds or less.</p> <p><b>5.508.2.1.2.1 Anchorage.</b> One-fourth-inch OD tubing shall be securely clamped to a rigid base to keep vibration levels below 8 mils.</p> <p><b>5.508.2.1.3 Flared tubing connections.</b> Double-flared tubing connections may be used for pressure controls, valve pilot lines and oil.</p> <p><b>Exception:</b> 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.</p> <p><b>5.508.2.1.4 Elbows.</b> Short radius elbows are only permitted where space limitations prohibit use of long radius elbows.</p> <p><b>5.508.2.2 Valves.</b> Valves and fittings shall comply with the California Mechanical Code and as follows.</p> <p><b>5.508.2.2.1 Pressure relief valves.</b> 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.</p> <p><b>5.508.2.2.1.1 Pressure detection.</b> 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.</p> <p><b>5.508.2.2.2 Access valves.</b> Only Schrader access valves with a brass or steel body are permitted for use.</p> <p><b>5.508.2.2.2.1 Valve caps.</b> For systems with a refrigerant charge of 5 pounds or more, valve caps shall be brass or steel and not plastic.</p> <p><b>5.508.2.2.2.2 Seal caps.</b> If designed for it, the cap shall have a neoprene O-ring in place.</p> <p><b>5.508.2.2.2.2.1 Chain tethers.</b> Chain tethers to fit over the stem are required for valves designed to have seal caps.</p> <p><b>Exception:</b> Valves with seal caps that are not removed from the valve during stem operation.</p> <p><b>5.508.2.3 Refrigerated service cases.</b> 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.</p> <p><b>5.508.2.3.1 Coil coating.</b> Consideration shall be given to the heat transfer efficiency of coil coating to maximize energy efficiency.</p> <p><b>5.508.2.4 Refrigerant receivers.</b> Refrigerant receivers with capacities greater than 200 pounds shall be fitted with a device that indicates the level of refrigerant in the receiver.</p> <p><b>5.508.2.5 Pressure testing.</b> The system shall be pressure tested during installation prior to evacuation and charging.</p> <p><b>5.508.2.5.1 Minimum pressure.</b> The system shall be charged with regulated dry nitrogen and appropriate tracer gas to bring system pressure up to 300 psig minimum.</p> <p><b>5.508.2.5.2 Leaks.</b> Check the system for leaks, repair any leaks, and retest for pressure using the same gauge.</p> <p><b>5.508.2.5.3 Allowable pressure change.</b> 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.</p>

Y	N/A	RESPON. PARTY
		<p><b>5.508.2.6 Evacuation.</b> The system shall be evacuated after pressure testing and prior to charging.</p> <p><b>5.508.2.6.1 First vacuum.</b> Pull a system vacuum down to at least 1000 microns (+/- 50 microns), and hold for 30 minutes.</p> <p><b>5.508.2.6.2 Second vacuum.</b> Pull a second system vacuum to a minimum of 500 microns and hold for 30 minutes.</p> <p><b>5.508.2.6.3 Third vacuum.</b> 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.</p>
		<p><b>CHAPTER 7</b>  <b>INSTALLER &amp; SPECIAL INSPECTOR QUALIFICATIONS</b>  <b>702 QUALIFICATIONS</b>  <b>702.1 INSTALLER TRAINING.</b> HVAC system installers shall be trained and certified in the proper installation of HVAC systems including ducts and equipment by a nationally or regionally recognized training or certification program. Uncertified persons may perform HVAC installations when under the direct supervision and responsibility of a person trained and certified to install HVAC systems or contractor licensed to install HVAC systems. Examples of acceptable HVAC training and certification programs include but are not limited to the following:</p> <ol style="list-style-type: none"> <li>1. State certified apprenticeship programs.</li> <li>2. Public utility training programs.</li> <li>3. Training programs sponsored by trade, labor or statewide energy consulting or verification organizations.</li> <li>4. Programs sponsored by manufacturing organizations.</li> <li>5. Other programs acceptable to the enforcing agency.</li> </ol> <p><b>702.2 SPECIAL INSPECTION [HCD].</b> When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition to other certifications or qualifications acceptable to the enforcing agency, the following certifications or education may be considered by the enforcing agency when evaluating the qualifications of a special inspector:</p> <ol style="list-style-type: none"> <li>1. Certification by a national or regional green building program or standard publisher.</li> <li>2. Certification by a statewide energy consulting or verification organization, such as HERS raters, building performance contractors, and home energy auditors.</li> <li>3. Successful completion of a third party apprentice training program in the appropriate trade.</li> <li>4. Other programs acceptable to the enforcing agency.</li> </ol> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.</li> <li>2. HERS raters are special inspectors certified by the California Energy Commission (CEC) to rate homes in California according to the Home Energy Rating System (HERS).</li> </ol> <p><b>[BSC-CG]</b> When required by the enforcing agency, the owner or the responsible entity acting as the owner's agent shall employ one or more special inspectors to provide inspection or other duties necessary to substantiate compliance with this code. Special inspectors shall demonstrate competence to the satisfaction of the enforcing agency for the particular type of inspection or task to be performed. In addition, the special inspector shall have a certification from a recognized state, national or international association, as determined by the local agency. The area of certification shall be closely related to the primary job function, as determined by the local agency.</p> <p><b>Note:</b> Special inspectors shall be independent entities with no financial interest in the materials or the project they are inspecting for compliance with this code.</p> <p><b>703 VERIFICATIONS</b>  <b>703.1 DOCUMENTATION.</b> Documentation used to show compliance with this code shall include but is not limited to, construction documents, plans, specifications, builder or installer certification, inspection reports, or other methods acceptable to the enforcing agency which demonstrate substantial conformance. When specific documentation or special inspection is necessary to verify compliance, that method of compliance will be specified in the appropriate section or identified applicable checklist.</p>