# Summary of Model Code Amendments:

This model California Electric Vehicle (EV) code builds on the CALGreen 2022 Intervening Cycle updates adopted by the state in 2024 and effective 7/1/2024. It incorporates updates expected in the 2025 CALGreen Cycle, based on Express Terms published in March 2024. The major changes addressed by the model code (in comparison to the 2022 Intervening Cycle base code) are summarized below:

## Key Residential Reach Code Amendments:

* **One & Two Family Dwellings:** Requires installation of one Level 2 EV charging receptacle and, if a second parking space is provided, an additional Level 1 Receptacle.
* **Multifamily Dwellings:** Requires one low-power Level 2 EV charging receptacle per dwelling unit with a parking space.
  + Specifies requirements based on whether parking is assigned or unassigned to residents.
  + For assigned parking, requires charging circuits and directly metered to the dwelling unit’s electric utility meter. (See Direct Metering below)
  + For unassigned parking, requires 25 percent of unassigned spaces include Level 2 EV Charging Stations installed.
  + **Direct Metering:** Instead of requiring multifamily assigned parking EV receptacles to be wired directly to each dwelling unit’s electric panel, requires connection to the dwelling unit’s meter, which may allow for future virtual submetering technologies instead of direct wiring.
  + Allows direct current fast charging (DCFC) to substitute for 5 EV charging station spaces.
* **Hotels & Motels:** Moves Hotel/Motel requirements to their own section within the Residential code and increases number of spaces with EV chargers required to 25%.
* **Additions & Alterations at Multifamily or Hotel/Motel Parking:** Clarifies the types of projects that count as an addition or alteration (and exceptions). Requires each added or altered space to have at least a low power Level 2 EV receptacle.
  + Specifies treatment for buildings with and without existing EV capable spaces.
* **Charging plug standards:** Allows for use of either J1772 or J3400 (also known as NACS) connector type in any combination.
* **Cost Exceptions:** Incorporates cost thresholds of greater than $4,500 per EV parking space for exceptions from EV infrastructure requirements.

## Key Non-Residential Reach Code Amendments:

* **Number of EV Capable or EVCS spaces impacted:** Increases total EV space requirement to 45% of parking spaces, aligned with proposed 2025 Tier 2 requirements.
* **Office & Retail Requirements:** Increases ratio of required EV Charging Station spaces for Office and Retail locations.
* **Charging plug standards:** Allows for use of both J1772 or J3400 plug connector standards (also known as NACS).
* **Cost Exceptions:** Incorporates cost thresholds of greater than $4,500 per EV parking space for exceptions from light duty EV infrastructure requirements, and $10,000 for medium- and heavy-duty EV infrastructure.

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| **Version Date** | **Summary of Updates** |
| March 2024 | 1st draft |

# Chapter 2 – Definitions

**AFFORDABLE HOUSING** Residential buildings that entirely consist of units below market rate and whose rents or sales prices are governed by local agencies to be affordable based on area median income.

**ASSIGNED PARKING.** Parking spaces in a residential parking facility that are assigned or designated for use by a specific living unit within the building or residence.

**AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS). [BSC-CG, DSA-SS and HCD]**A system designed to manage load across one or more electric vehicle supply equipment (EVSE) to share electrical capacity and/or automatically manage power at each connection point.

**DIRECT CURRENT FAST CHARGING (DCFC)** A parking space provided with electrical infrastructure that meets the following conditions:

1. A minimum of 48 kVA (480 volt, 100-ampere) capacity wiring.
2. Electric vehicle supply equipment (EVSE) located within three (3) feet of the parking space providing a minimum capacity of 80-ampere.

**ELECTRIC VEHICLE (EV) CAPABLE SPACE. [BSC-CG, DSA-SS and HCD]** A vehicle space with electrical panel space and load capacity to support a branch circuit and necessary raceways, both underground and/or surface mounted, to support EV charging.

**ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG, HCD]** Off-board charging equipment used to charge an electric vehicle.

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

**ELECTRIC VEHICLE CHARGING STATION (EVCS). [BSC-CG, DSA-SS, HCD]** One or more electric vehicle charging spaces served by EVSE or receptacle(s).

**ELECTRIC VEHICLE (EV) READY SPACE. [HCD]**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.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). [BSC-CG, DSA-SS and HCD]**The conductors, including the ungrounded, grounded and equipment grounding conductors and the electric vehicle connectors, attachment plugs, personnel protection system, 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.

**LEVEL 1 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. [DSA-SS]** A 120-volt 20-ampere minimum branch circuit and a receptacle.

**LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG, HCD]** A 208/240-volt 30-ampere minimum electric vehicle charger connected to the premises electrical system capable of charging electric vehicles.

**LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE.** A 208/240-volt 40-ampere minimum branch circuit and a receptacle.

**LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT. [BSC-CG, DSA-SS, HCD]** The 208/240-volt 40-ampere branch circuit, and the electric vehicle charging 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.

**LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. [BSC-CG, DSA-SS, HCD]** A 208/240-volt 20-ampere minimum branch circuit and a receptacle.

**UNASSIGNED OR COMMON USE PARKING.** Parking spaces in a residential parking facility that are not reserved for or assigned to a specific living unit within the building or residence, including guest, staff, or other non-resident parking.

# Chapter 3 – Green Building

**301.1.1 Additions and alterations.**

**[HCD]**The mandatory provisions of Chapter 4 shall be applied to additions or alterations of existing residential buildings where the addition or alteration increases the building’s conditioned area, volume or size. The requirements shall apply only to and/or within the specific area of the addition or alteration.

The mandatory provisions of Section 4.106.4.2 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing multifamily buildings. See Section 4.106.4.3 for application.

**NOTE:** Repairs including, but not limited to, resurfacing, restriping, and repairing or maintaining existing lighting fixtures are not considered alterations for the purpose of this section.

**301.3 Nonresidential additions and alterations.**

**[BSC-CG]** 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.

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.

The mandatory provisions of Section 5.106.5.3 may apply to additions or alterations of existing parking facilities or the addition of new parking facilities serving existing nonresidential buildings. See Section 5.106.5.4 for application.

**NOTE:** Repairs including, but not limited to, resurfacing, restriping, and repairing or maintaining existing lighting fixtures are not considered alterations for the purpose of this section.

# Chapter 4 – Residential Mandatory Measures

**4.106.4 Electric vehicle (EV) charging for new construction.**

New construction shall comply with Section 4.106.4.1 or 4.106.4.2. Electric vehicle supply equipment (EVSE) shall comply with the [*California Electrical Code*](https://codes.iccsafe.org/lookup/CAEC%E2%80%9419/3352).

**Exceptions:**

1. On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:
   1. Where there is no local utility power supply or the local utility is unable to supply adequate power.
   2. Where there is evidence suitable to the local enforcing agency substantiating that additional local utility infrastructure design requirements, directly related to the implementation of Section 4.106.4, may increase construction cost by an average of $4,500 per parking space for market rate housing or $400 per parking space for affordable housing. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service. ~~adversely impact the construction cost of the project.~~
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities and without electrical panel upgrade or new panel installation. Detached ADUs, attached ADUs, and JADUs without additional parking but with electrical panel upgrades or new panels must have reserved breakers and electrical capacity according to the requirements of 4.106.4.1.

**4.106.4.1 ~~New o~~One- and two-family dwellings and townhouses with attached private garages.**

**4.106.4.1.1. New Construction.** Install one Level 2 EV Charging Receptacle in one parking space. If a second parking space is provided, it shall be provided with a Level 1 EV Charging Receptacle and ~~For each dwelling unit, install~~ a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). ~~The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere 208/240-volt minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.~~

**~~Exception:~~**~~A raceway is not required if a minimum 40-ampere 208/240-volt dedicated EV branch circuit is installed in close proximity to the proposed location of an EV charger at the time of original construction in accordance with the~~[*~~California Electrical Code~~*](https://codes.iccsafe.org/lookup/CAEC%E2%80%9419/3352)~~.~~

**~~4.106.4.1.1 Identification.~~**

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

**4.106.4.1.2. Existing Building**. Parking additions or electrical panel upgrades must have reserved breaker spaces and electrical capacity according to the requirements of 4.106.4.1.1.

**4.106.4.2 New multifamily dwellings, hotels and motels and new residential parking facilities.**

When parking is provided, parking spaces for new multifamily dwellings, hotels and motels shall meet the requirements of Section 4.106.4.2.2 Calculations for spaces shall be rounded up to the nearest whole number. A parking space served by electric vehicle supply equipment or designed as an 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 a local jurisdiction. See Vehicle Code Section 22511.2 for further details.

**4.106.4.2.1**

**Reserved.**

1. **4.106.4.2.2 Multifamily dwellings~~, hotels and motels~~.** **EV ready parking spaces with receptacles.** 
   1. **~~Hotels and motels.~~**~~Forty (40) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles.~~
      1. **Multifamily parking facilities with assigned parking.** Where dwelling units are provided with assigned parking spaces equal to or greater than the number of dwelling units, at least one low power Level 2 EV charging receptacle shall be provided at an assigned parking space for each dwelling unit. ~~Forty (40) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles. EV charging receptacles required by this section shall be located in at least one assigned parking space per dwelling unit where assigned parking is provided but need not exceed forty (40) percent of the total number of assigned parking spaces provided on the site.~~
         1. Where the total number of dwelling units exceeds the number of assigned parking spaces, all assigned parking spaces shall be provided with one low power Level 2 EV charging receptacle.

**~~Exception:~~**~~Areas of parking facilities served by parking lifts, including but not limited to automated mechanical-access open parking garages as defined in the~~*~~California Building Code~~*~~; or parking facilities otherwise incapable of supporting electric vehicle charging.~~

* + 1. **Multifamily Parking Facilities with Unassigned or Common use Parking.** Where dwelling units are provided with unassigned parking spaces equal to or greater than the number of dwelling units, at least one low power Level 2 EV charging receptacle shall be provided at an unassigned parking space for seventy-five (75) percent of total dwelling units.
       1. Where the total number of dwelling units exceeds the number of unassigned parking spaces, seventy-five (75) percent of unassigned parking spaces shall be provided with one low power Level 2 EV charging receptacle.
    2. **Multifamily Parking Facilities with Assigned and Unassigned Parking.** Where dwelling units are provided with both assigned and unassigned parking spaces, at least one low power Level 2 EV charging receptacle shall be provided for each assigned space. For unassigned or common use parking, at least one low power Level 2 EV charging receptacle shall be provided at seventy-five (75) percent of spaces.
    3. **Receptacle power source.** EV charging receptacles in multifamily parking facilities at assigned parking spaces shall be ~~provided with a dedicated branch circuit~~ connected to the dwelling unit’s electrical meter ~~panel~~, unless determined as infeasible by the project builder or designer and subject to concurrence of the local enforcing agency.

**~~Exception:~~**~~Areas of parking facilities served by parking lifts, including but not limited to automated mechanical-access open parking garages as defined in the~~*~~California Building Code~~*~~; or parking facilities otherwise incapable of supporting electric vehicle charging.~~

* + 1. **Receptacle configurations.**208/240V EV charging receptacles shall comply with one of the following configurations:
       1. For 20-ampere receptacles, NEMA 6-20R
       2. For 30-ampere receptacles, NEMA 14-30R
       3. For 50-ampere receptacles, NEMA 14-50R

1. **EV ready parking spaces with EV chargers.**
   * 1. **~~Hotels and motels.~~**~~Ten (10) percent of the total number of parking spaces shall be equipped with Level 2 EV chargers. At least fifty (50) percent of the required EV chargers shall be equipped with J1772 connectors.~~
     2. **Multifamily parking facilities with unassigned or common use parking.** In addition to the low power Level 2 EV charging receptacle requirements of section 4.106.4.2.2 (1), twenty-five (25) percent of unassigned or common use parking spaces shall be equipped with Level 2 EV chargers and shall be made available for use by all residents or guests. ~~Ten (10) percent of the total number of parking spaces shall be equipped with Level 2 EV chargers. At least fifty (50) percent of the required EV chargers shall be equipped with J1772 connectors. Where common use parking or unassigned parking is provided, EV chargers shall be located in common use or unassigned parking areas and shall be available for use by all residents or guests.~~
     3. **EV Charger Connectors**. EV chargers shall be equipped with J1772 or J3400 connectors.
     4. An automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to each space served by the ALMS. The electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EV chargers shall have a capacity of not less than 30 amperes.

~~Where low power Level 2 EV charging receptacles or Level 2 EV chargers are installed beyond the minimum required, an automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to each space served by the ALMS. The electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EV chargers shall have a capacity of not less than 30 amperes.~~

**4.106.4.2.2.1 Electric vehicle charging stations (EVCS).**

Electric vehicle charging stations required by [Section 4.106.4.2.2](https://codes.iccsafe.org/lookup/CAGBC2022P3_Ch04_SubCh4.1_Sec4.106.4.2.2/3352), Item 2, with EV chargers installed shall comply with [Section 4.106.4.2.2.1.1](https://codes.iccsafe.org/lookup/CAGBC2022P3_Ch04_SubCh4.1_Sec4.106.4.2.2.1.1/3352).

**Exception:** Electric vehicle charging stations serving public accommodations, public housing, motels, and hotels shall not be required to comply with this section. See *California Building Code*, [Chapter 11B](https://codes.iccsafe.org/lookup/CABC2022P3_Ch11B/3352), for applicable requirements.

**4.106.4.2.2.1.1 Electric vehicle charging stations (EVCS) spaces with EV chargers installed; dimensions and location.**

EVCS spaces shall be designed to comply with the following:

1. The minimum length of each EVCS space shall be 18 feet (5486 mm).
2. The minimum width of each EVCS space shall be 9 feet (2743 mm).
3. One in every 25 EVCS spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EVCS space is 12 feet (3658 mm). Surface slope for this EVCS space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction. These EVCS spaces shall also comply with at least one of the following:
   1. The EVCS space shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code*, [Chapter 11A](https://codes.iccsafe.org/lookup/CABC2022P3_Ch11A/3352), to allow use of the EV charger from the accessible parking space.
   2. The EVCS space shall be located on an accessible route, as defined in the *California Building Code*, [Chapter 2](https://codes.iccsafe.org/lookup/CAGBC2022P3_Ch02/3352), to the building.

**Exception:**Electric vehicle charging stations designed and constructed in compliance with the California Building Code, [Chapter 11B](https://codes.iccsafe.org/lookup/CABC2022P3_Ch11B/3352), are not required to comply with Section 4.106.4.2.2.1.1.

**4.106.4.2.2.1.2 Accessible electric vehicle charging station spaces.**

In addition to the requirements in Section 4.106.4.2.2.1.1, all EV chargers, where installed, shall comply with the accessibility provisions for EV chargers in the *California Building Code*, [Chapter 11B](https://codes.iccsafe.org/lookup/CBC2019P1_Ch11B/3352). EV ready spaces and EVCS in multifamily developments shall comply with *California Building Code*, Chapter 11A, [Section 1109A](https://codes.iccsafe.org/lookup/CBC2019P1_Ch11A_SubCh02_Sec1109A/3352).

**4.106.4.2.3**

**Reserved.**

**4.106.4.2.4**

**Reserved.**

**4.106.4.2.5 Electric vehicle ready space signage.**

Electric vehicle ready spaces 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).

**4.106.4.2.6 Hotels and motels.**

1. **EV** **Ready Parking Spaces with Receptacles.**
   1. **Hotels and Motels**. Forty (40) percent of the total number of parking spaces shall be equipped with low power Level 2 EV charging receptacles.

**~~Exception~~**~~: Areas of parking facilities served by parking lifts, including but not limited to automated mechanical-access open parking garages as defined in the California Building Code; or parking facilities otherwise incapable of supporting electric vehicle charging.~~

* 1. **Receptacle Configurations.** 208/240V EV charging receptacles shall comply with one of the following configurations:
     1. For 20- ampere receptacles, NEMA 6-20R
     2. For 30- ampere receptacles, NEMA 14-30R
     3. For 50- ampere receptacles, NEMA 14-50R

2. **EV Ready Parking Spaces with EV Chargers.**

* 1. **Hotels and Motels.** Twenty-five (25) percent of the total number of parking spaces shall be equipped with Level 2 EV chargers.
  2. **EV Charger Connectors**. EV chargers shall be equipped with J1772 or J3400 connectors.

An automatic load management system (ALMS) may be used to reduce the maximum required electrical capacity to each space served by the ALMS. The electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EV chargers shall have a capacity of not less than 30 amperes.

**4.106.4.3 Electric vehicle charging for additions and alterations of parking facilities serving existing multi-family buildings, hotels and motels.**

Existing buildings or parking facilities being modified by one of the following shall comply with Section 4.106.4.3. When EVSE is installed, accessible EVCS shall be provided in accordance with the California Building Code, Chapter 11B, [Section 11B-228.3](https://codes.iccsafe.org/lookup/CBC2019P1_Ch11B_SubCh02_Sec11B_228.3/3352).

1. When the scope of construction work includes an increase or alteration to power supply to an electric service panel as part of a parking facility addition or alteration.
2. When a new photovoltaic system is installed covering existing parking spaces.
3. When additions or alterations to existing buildings are triggered pursuant to code Section 301.1 and the scope of work includes an increase in power supply to an electric service panel.
4. Addition of parking facilities or alterations that include breaking ground on existing parking surfaces.

**Exceptions:**

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:
   1. Where there is no local utility power supply.
   2. Where the local utility is unable to supply adequate power.
   3. 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 4.106.4.3, may increase construction cost by an average of $4,500 per parking space. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service. ~~adversely impact the construction cost of the project~~.
   4. Where demonstrated as impracticable excluding local utility service or utility infrastructure issues.
2. Remote parking facilities that do not have access to the building service panel.
3. Parking area lighting upgrades where no trenching is part of the scope of work.
4. Emergency repairs, including but not limited to water line break in parking facilities, natural disaster repairs, etc.
5. Alterations that solely add Level 1 EV charging receptacles or Level 1 EV chargers, and no other addition or alteration is performed within the parking facility.

**4.106.4.3.1 Existing multifamily and hotel/motel buildings or parking areas without previously installed EV capable infrastructure.**

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 4.106.4.3, each parking space added or altered shall have access to either a low power Level 2 EV charging receptacle or Level 2 EV charger, unless determined as infeasible by the project builder or designer and subject to concurrence of the local enforcing agency.

**4.106.4.3.2 Existing buildings or parking areas with previously installed EV capable infrastructure.**

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 4.106.4.3, each parking space added or altered shall have access to either a low power Level 2 EV charging receptacle or Level 2 EV charger, unless determined as infeasible by the project builder or designer and subject to concurrence of the local enforcing agency. Construction shall utilize 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.

* + 1. ~~Where new parking facilities are added, or electrical systems or lighting of existing parking facilities are added or altered and the work requires a building permit, ten (10) percent of the total number of parking spaces added or altered shall be EV capable spaces to support future Level 2 electric vehicle supply equipment. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging purposes as “EV CAPABLE.”~~

**Exception:**

When new parking facilities are added and ALMS is installed, the electrical system and any on-site distribution transformers shall have sufficient capacity to deliver at least 3.3 kW simultaneously to each EV charging station (EVCS) served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EV chargers shall have a capacity of not less than 30 amperes.

**~~Notes:~~**

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

**4.106.4.4. Direct current fast charging stations.** One DCFC may be substituted for up to five (5) EVCS or ten (10) low power level 2 EV Ready spaces to meet the requirements of 4.106.4.2 and 4.106.4.3. Where ALMS serve DCFC stations, the power demand from the DCFC shall be prioritized above Level 1 and Level 2 spaces.

# Chapter 5 – Nonresidential Mandatory Measures

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

**[N] [BSC-CG]** Construction to provide electric vehicle infrastructure and facilitate electric vehicle charging shall comply with Section 5.106.5.3.1 EV capable spaces and 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 [*California Building Code*](https://codes.iccsafe.org/lookup/CBC%E2%80%9422/3352) and the *California Electrical Code*.

**Exceptions:**

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:
   1. Where there is no local utility power supply.
   2. Where the local utility is unable to supply adequate power.
   3. 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 increase construction cost by an average of $4,500 per parking space. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service. ~~adversely impact the construction cost of the project.~~
2. Alterations that solely add Level 1 EV charging receptacles or Level 1 EV chargers, and no other addition or alteration is performed. ~~Parking spaces accessible only by automated mechanical car parking systems are not required to comply with this code section.~~

**5.106.5.3.1 EV capable spaces.**

**[N]** EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:

1. 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.
2. 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.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.
4. 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.”

**Note:** 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.

**TABLE 5.106.5.3.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **FACILITY TYPE** | **NUMBER OF REQUIRED EV CAPABLE OR EVCS SPACES** | **NUMBER OF REQUIRED EV CAPABLE SPACES1** | **NUMBER OF REQUIRED EVCS1,2** |
| Office & Retail | 45% of actual parking spaces | 11% of actual parking spaces | 34% of actual parking spaces |
| All Other | 45% of actual parking spaces | 22% of actual parking spaces | 23% of actual parking spaces |

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. At least one Level 2 EVSE shall be provided.

|  |  |  |
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| **~~TOTAL NUMBER OF ACTUAL PARKING SPACES~~** | **~~NUMBER OF REQUIRED EV CAPABLE SPACES~~** | **~~NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE)~~~~2, 3~~** |
| ~~0–9~~ | ~~0~~ | ~~0~~ |
| ~~10–25~~ | ~~4~~ | ~~0~~ |
| ~~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 actual parking spaces~~~~1~~ | ~~25 percent of EV capable spaces~~~~1~~ |

1. ~~Calculation for spaces shall be rounded up to the nearest whole number.~~
2. ~~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.~~
3. ~~At least one Level 2 EVSE shall be provided.~~

**5.106.5.3.2 Electric vehicle charging stations (EVCS).**

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 DCFC 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.

**5.106.5.3.2.1 Receptacle Configurations.** 208/240V EV charging receptacles

shall comply with one of the following configurations:

* + 1. For 20-ampere receptacles, NEMA 6-20R.
    2. For 30-ampere receptacles, NEMA 14-30R.
    3. For 50-ampere receptacles, NEMA 14-50R.

**5.106.5.3.2.2 EV Charger Connectors.** EV chargers shall be equipped with SAE

J1772 with a maximum output 240 Volts AC or SAE J3400 connectors.

When using level 2 SAE J3400 SAE connectors, supplied by a 480 V 3-phase

service, then at least 20 percent of the EV charger connectors shall be SAE

J1772 with a maximum output 240 Volts AC.

**5.106.5.3.2.~~1~~3**

The installation of each DCFC 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.

**5.106.5.3.2.~~2~~4**

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.

**5.106.5.3.2.4.1 Raceway Capacity Requirements.** To allow for future upgrades to the electrical conductors serving low power Level 2 charging receptacles, the listed raceway serving such receptacles shall be sized to allow the installation of a dedicated 208/240-volt 40-ampere branch circuit. Where no raceway is used, the conductors shall be sized to accommodate a 208/240-volt 40-ampere receptacle.

**5.106.5.3.3 Use of automatic load management systems (ALMS).**

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.

**5.106.5.3.4 Accessible electric vehicle charging station (EVCS).**

When EVSE is installed, accessible EVCS shall be provided in accordance with the *California Building Code*, Chapter 11B, [Section 11B-228.3](https://codes.iccsafe.org/lookup/CBC2019P1_Ch11B_SubCh02_Sec11B_228.3/3352).

**5.106.5.3.5 Electric vehicle charging station signage.**

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).

**5.106.5.3.6 Electric vehicle charging stations (EVCS)—power allocation method.**

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.

Power allocation method shall include the following:

1. Use any kVA combination of EV capable spaces, low power Level 2, Level 2 or DCFC EVSEs.
2. At least one Level 2 EVSE shall be provided.

**TABLE 5.106.5.3.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **FACILITY TYPE** | **MINIMUM TOTAL kVA @ 6.6 kVA1** | **MAXIMUM kVA ALLOWED FOR EV CAPABLE SPACES1, 2** | **MINIMUM kVA REQUIRED IN ANY COMBINATION OF LOW POWER LEVEL 2, LEVEL 2, OR DCFC1, 3,** |
| **Office & Retail** | 45% of actual parking spaces x 6.6 | 11% of actual parking spaces x 6.6 | 34% of actual parking spaces x 6.6 |
| **All Other** | 45% of actual parking spaces x 6.6 | 22% of actual parking spaces x 6.6 | 23% of actual parking spaces x 6.6 |

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. If EV capable spaces are utilized, they shall meet the requirements of Section 5.106.5.3.1 EV capable spaces.
3. Level 2 EVSE @ 6.6 kVA minimum.

|  |  |  |
| --- | --- | --- |
| **~~TOTAL NUMBER OF ACTUAL PARKING SPACES~~** | **~~MINIMUM TOTAL kVA @ 6.6 kVA~~** | **~~TOTAL kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE,~~~~3,4~~ ~~LOW POWER LEVEL 2, LEVEL 2,~~~~1, 2~~ ~~OR DCFC~~** |
| ~~0–9~~ | ~~0~~ | ~~0~~ |
| ~~10–25~~ | ~~26.4~~ | ~~26.4~~ |
| ~~26–50~~ | ~~52.8~~ | ~~52.8~~ |
| ~~51–75~~ | ~~85.8~~ | ~~85.8~~ |
| ~~76–100~~ | ~~112.2~~ | ~~112.2~~ |
| ~~101–150~~ | ~~165~~ | ~~165~~ |
| ~~151–200~~ | ~~231~~ | ~~231~~ |
| ~~201 and over~~ | ~~20 percent of actual parking spaces × 6.6~~ | ~~Total required kVA = P × .20 × 6.6 Where P = Parking spaces in facility~~ |

1. ~~Level 2 EVSE @ 6.6 kVA minimum.~~
2. ~~At least one Level 2 EVSE shall be provided.~~
3. ~~Maximum allowed kVA to be utilized for EV capable spaces is 5075 percent.~~
4. ~~If EV capable spaces are utilized, they shall meet the requirements of Section 5.106.5.3.1 EV capable spaces.~~

**5.106.5.3.6.1 Receptacle Configurations.** 208/240V EV charging receptacles

shall comply with one of the following configurations:

* + 1. For 20-ampere receptacles, NEMA 6-20R.
    2. For 30-ampere receptacles, NEMA 14-30R.
    3. For 50-ampere receptacles, NEMA 14-50R.

**5.106.5.3.6.2 EV Charger Connectors.** EV chargers shall be equipped with SAE

J1772 with a maximum output 240 Volts AC or SAE J3400 connectors.

When using level 2 SAE J3400 SAE connectors, supplied by a 480 V 3-phase

service, then at least 20 percent of the EV charger connectors shall be SAE

J1772 with a maximum output 240 Volts AC.

**5.106.5.3.6.3 Raceway Capacity Requirements.** To allow for future upgrades to the electrical conductors serving low power Level 2 charging receptacles, the listed raceway serving such receptacles shall be sized to allow the installation of a dedicated 208/240-volt 40-ampere branch circuit. Where no raceway is used, the conductors shall be sized to accommodate a 208/240-volt 40-ampere receptacle.

**5.106.5.4 Additions or alterations to existing buildings or parking facilities [A].**

**[BSC-CG]** 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 California Building Code, Chapter 11B, [Section 11B-228.3](https://codes.iccsafe.org/lookup/CBC2019P1_Ch11B_SubCh02_Sec11B_228.3/3352).

1. When the scope of construction work includes an increase or alteration ~~in~~to power supply to an electric service panel as part of a parking facility addition or alteration.
2. When a new photovoltaic system is installed covering existing parking spaces.
3. 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.
4. Addition of parking facilities or alterations that include breaking ground on existing parking surfaces

**Exceptions:**

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:
   1. Where there is no local utility power supply.
   2. Where the local utility is unable to supply adequate power.
   3. 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 increase construction cost by an average of $4,500 per parking space. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service. ~~adversely impact the construction cost of the project~~.
   4. Where demonstrated as impracticable excluding local utility service or utility infrastructure issues.
2. Remote parking facilities that do not have access to the building service panel.
3. Parking area lighting upgrades where no trenching is part of the scope of work.
4. Emergency repairs, including but not limited to water line break in parking facilities, natural disaster repairs, etc.

**5.106.5.4.1 Existing buildings or parking areas without previously installed EV capable infrastructure [A].**

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 for the total number of actual parking spaces being added or altered.

**5.106.5.4.2 Existing buildings or parking areas with previously installed EV capable infrastructure [A].**

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.

**5.106.5.5 Electric vehicle (EV) charging: medium-duty and heavy-duty.**

**[N] [BSG-CG]** 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.

**Exceptions:**

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:
   1. Where there is no local utility power supply.
   2. Where the local utility is unable to supply adequate power.
   3. 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 increase construction cost by an average of $10,000 per parking space. EV infrastructure shall be provided up to the level that would not exceed this cost for utility service. ~~adversely impact the construction cost of the project.~~

When EVSE(s) is/are installed, it shall be in accordance with the [*California Building Code*](https://codes.iccsafe.org/lookup/CBC%E2%80%9422/3352), the [*California Electrical Code*](https://codes.iccsafe.org/lookup/CAEC%E2%80%9419/3352) and as follows:

**5.106.5.5.1 Electric vehicle charging readiness requirements for warehouses, grocery stores, office buildings, and manufacturing facilities and retail stores with planned off-street loading spaces.**

**[N]** 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*](https://codes.iccsafe.org/lookup/CAEC%E2%80%9419/3352). Construction plans and specifications shall include, but are not limited to, the following:

1. 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.
2. 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.
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.
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 5.106.5.5.1.

**TABLE 5.106.5.5.1**

**RACEWAY CONDUIT AND PANEL POWER REQUIREMENTS FOR MEDIUM- AND HEAVY-DUTY EVSE [N]**

|  |  |  |  |
| --- | --- | --- | --- |
| **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 |
| 3 or Greater | 400 |
| Greater than 90,000 | 1 or Greater | 400 |
| Manufacturing Facilities | 10,000 to 50,000 | 1 or 2 | 200 |
| 10,000 to 50,000 | 3 or Greater | 400 |
| Greater than 50,000 | 1 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 |
| 3 or Greater | 400 |
| Greater than 135,000 | 1 or Greater | 400 |
| Warehouse | 20,000 to 256,000 | 1 or 2 | 200 |
| 3 or Greater | 400 |
| Greater than 256,000 | 1 or Greater | 400 |