

Comments on CALGreen Electric Vehicle Proposals for the 2022 Intervening Code Adoption Cycle

CALIFORNIA STATEWIDE UTILITY CODES AND STANDARDS TEAM

May 12, 2023

Dear Building Standards Commission (BSC), Department of Housing and Community Development (HCD), and Division of State Architect (DSA) staff:

The California Statewide Utility Codes and Standards Team appreciates the opportunity to participate in the 2022 Intervening Code Adoption Cycle for Title 24, Part 11 (CALGreen), and to provide comments on proposed code changes leading up to the publication of the Intervening Supplement to the 2022 California Building Standards Code, Title 24. The Statewide Utility Codes and Standards Team actively supports code-setting bodies in developing and revising building energy codes and standards. The program's objective is to achieve significant energy savings and assist in meeting other energy-related state policy goals through the development of reasonable, responsible, and cost-effective code changes. This program is funded by California utility customers and administered by Pacific Gas and Electric (PG&E), San Diego Gas & Electric (SDG&E), and Southern California Edison (SCE) under the auspices of the California Public Utilities Commission. The Statewide Utility Codes and Standards Team is coordinating with electric vehicle program experts within each respective utility.

1. We support the proposed code changes intended to streamline and align EV charging infrastructure provisions.

We are in strong support of these code changes that improve access to and availability of EV charging infrastructure in the state. We want to thank BSC, HCD, and DSA for considering and incorporating some of the changes we recommended in our October 2022 comment letter to prioritize existing EV capable infrastructure during the addition and alteration process.

We have also finalized the following report on the Medium/Heavy-duty EV Cost Model: <https://title24stakeholders.com/measures/2022-calgreen/medium-and->

[heavy-duty-ev-charging-infrastructure-cost-analysis/](#). We hope this is helpful in furthering support for the proposed standards, particularly to Table 5.106.5.5.1.

We offer the following additional comments to support future-proofing the standard to avoid added future costs or stranded assets, to maximize flexibility in available technologies to further reduce costs and improve grid benefits, and to improve clarity in the code. We have used double underline and ~~double-strikeout~~ to differentiate proposed changes from the 45-day language. An Appendix at the end of this comment contains our recommended changes using a similar format to the Commission Action Matrix for easier reference.

2. We recommend changes to the terminology framework to improve clarity and avoid duplicative acronyms.

The following changes to terminology used throughout CALGreen are a simple way to improve the clarity of the code and reduce duplicative terminology, supporting point 6 of the Nine-Point Criteria (Health and Safety Code Section 18930(a)). While we think these changes are important for clarity and easier implementation of the code, we recognize that the agencies may be reluctant to implement a shift in terminology in an intervening code cycle update. If that is the case, we recommend that BSC, HCD, and DSA add this to the issues that will be discussed in workshops for the next regular code cycle update.

a. EV Space

The acronym for EV Charging Station (EVCS) may too easily be confused with two other defined terms with the same acronym – EV Charging Space, EV Capable Space. To avoid this confusing terminology, we recommend reframing the terms related to parking spaces with dedicated EVSE or EVSE capability and deleting the definition of ELECTRIC VEHICLE CHARGING STATION (EVCS) altogether. Specifically, we recommend that BSC and HCD amend the following term and definition:

ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). A space intended for ~~the future installation of EV charging equipment and~~ charging of electric vehicles, that is equipped with an EVSE or equipped as EV Capable or EV Ready.

“EV Space” can then be used as an umbrella term for spaces that are either equipped with EVSE or that meet the requirements for EV Capable or EV Ready.

To demonstrate how this improves the clarity of the text, the following table highlights how this umbrella term and the terms that fall under it relate to any given parking space.

Table 1. Use of EV Space as an Umbrella Term

Space Configuration Definition Before Change	Change Activity	Defined Equipment Installed	Space Configuration Definitions After Change	After Change Activity, is this an EV Space?
Non-EV Space	Allocate capacity, install raceway	Panel Space, Load Capacity, and Raceway	EV Capable Space	Yes
EV Capable Space	Complete Branch Circuit, install Breaker, Conductors, and Receptacle	Branch Circuit and EV Charging Receptacle	EV Ready (Space) with Receptacle or EV Space with Receptacle	Yes
EV Capable Space	Complete Branch Circuit, install Breaker, Conductors, and EVSE	Branch Circuit and EVSE	EVSE Space or EV Space with EVSE	Yes

To integrate the “EV Space” umbrella term as suggested, please see the appendix at the end of this document summarizing the related provisions of the code that would need to be updated, arranged by BSC and HCD’s code action matrices.

b. EV Charger

“EV Charger” is a duplicative term for ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). We therefore suggest that both BSC and HCD either delete (or disapprove the addition of) the ELECTRIC VEHICLE (EV) CHARGER definition and terminology throughout the proposed language and replace it with the term EVSE as appropriate, or simply define “EV Charger” to mean “EVSE.” This would also apply to the term “Level 2 Electric Vehicle (EV) Charger,” which we would suggest be deleted and instead rely on the term “Level 2 Electric Vehicle Supply Equipment.”

c. EV Ready Space

We recommend updating the term “Electric Vehicle (EV) Ready Space” to align with the EV Ready definition used in the 2024 International Energy Conservation Code (IECC), a national model building code. In the IECC framework, EV Ready means a system that terminates with a receptacle or junction box (and not “a charger”). We believe making this change will ensure alignment with other codes and standards as indicated in point 7 of the Nine-Point Criteria. Therefore, we recommend the following change:

ELECTRIC VEHICLE (EV) READY SPACE. 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 junction box ~~a charger~~.

d. *Table 5.106.5.3.1 headings*

We recommend clarifying Tables 5.106.5.3.1, A5.106.5.3.1 Tier 1, and A5.106.5.3.3 Tier 2 by adding a column (see ii. below) and using the following column titles. This will reduce confusion and improve clarity by clearly separating quantities and types, as required by point 6 in the Nine-Point Criteria.

- i. TOTAL NUMBER OF ACTUAL PARKING SPACES
- ii. NUMBER OF REQUIRED EV SPACES (ALL TYPES)
- iii. NUMBER OF REQUIRED EV CAPABLE SPACES (WITHOUT TERMINATING IN A RECEPTACLE OR EVSE)
- iv. NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) EVSE SPACES

3. We recommend changes to the proposed implementation of ALMS to expand access to charging.

We recommend that automatic load management systems (ALMS) explicitly be allowed on all EV Spaces. For example, let’s say CALGreen requires that our parking lot have 10 EV spaces. If we voluntarily equip the parking lot with 10 additional EV spaces, it is not clear whether CALGreen allows ALMS on all 20 spaces or only the 10 spaces above code. We recommend that ALMS be allowed (not required) on all 20 spaces, not just the 10 spaces above code. Specifically, we recommend HCD amend Section 4.106.4.2.2 to read:

~~When~~Where low power Level 2 EVSE ~~charging receptacles~~ or Level 2 EVSE 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.

We don't recommend supporting EV Charging Receptacles with ALMS due to the possibility of a poor charging customer experience when receptacles are automatically turned off or on (versus EVSE with ALMS which can reduce the charging current).

These changes will allow for wider adoption of ALMS, helping to achieve greater grid and consumer benefits while reducing installed costs where feasible, consistent with points 3 and 5 of the Nine-Point Criteria. Although we think these changes are important and can be easily implemented during this intervening code cycle update, we acknowledge that more discussion may also help build support around this concept, and encourage BSC, HCD, DSA to at minimum consider this change at their workshops for the next regular code cycle.

4. We recommend that DCFC EVSE not be allowed to reduce the minimum number of EV Capable Spaces installed.

As building owners best understand the workforce charging needs appropriate to their project, CALGreen should allow building owners to trade among the required installed EVSE (either Level 2 or DCFC). However, CALGreen should require builders to include the maximum number of EV Capable Spaces *without* tradeoffs, as this reduces the cost of adding new charging spaces in the future to an existing workplace parking lot. To incorporate this point of view we suggest amending the language as follows:

5.106.5.3.2.1 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~~ EVSE Spaces by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.

We believe this change aligns with point 3 in the Nine-Point Criteria by improving building system performance. It is critically important that the code avoid reducing the number of EV Capable Spaces, even as it allows tradeoffs among types of EVSE (Level 2 or DCFC) installed. Therefore, we urge BSC to make this change in this intervening code cycle update to avoid construction that reduces the number of EV Capable Spaces and therefore may incur unreasonable upgrade costs to meet the anticipated future increase in EV charging demand.

5. We recommend against allowing receptacles over other EV charging infrastructure in CALGreen as the total cost to properly equip them approaches that of networked EVSE.

Low Power Level 2 Electric Vehicle (EV) Charging Receptacles may not be suitable for high-density residential and commercial applications. EV Charging Receptacles in these settings may require extra costs that approach those of networked EVSE. They include:

- Charge session access control, including networked connection, power relay, and possibly RF-ID or credit card readers
- Energy metering, including current sensors and possibly a display
- Commercial-level safety equipment, posts, and robust mounting means
- Industrial/commercial-grade receptacles supporting thousands of connection cycles.

Moreover, receptacles can only offer charge session management via on/off control versus that of networked EVSE which can offer reduced current control for a much better charging customer experience and more opportunities for grid support. Further, unmanaged receptacles demand more upstream capacity than managed EVSE (via ALMS), increasing project costs. Receptacles can also pose accessibility issues, especially receptacles greater than 20 amperes (high insertion/removal force, reach distances, etc.). This puts receptacles at risk of conflicting with Section 5.106.5.3.4, requiring that EVSE be accessible in accordance with California Building Code Chapter 11B Section 11B-228.3.

Rather than allow Low Power Level 2 Electric Vehicle (EV) Receptacles to replace EV Capable Spaces, we recommend that Low Power Level 2 EVSE be adopted into the language and serve that purpose. This would be implemented with the following language:

Definition. LOW POWER LEVEL 2 EVSE. A Level 2 EVSE supplied by a 20-ampere minimum circuit breaker and 40-ampere minimum branch circuit conductors, where the EVSE is configured to match the circuit breaker.

Section 5.106.5.3.2.2. The installation of two Low Power Level 2 ~~EV charging receptacles~~ EVSEs shall be permitted to reduce the minimum number of required EV capable spaces without EVSE in Table 5.106.5.3.1 by one.

We recognize that this type of change may not be easily implemented in the intervening code cycle update, and therefore recommend that BSC and HCD, at minimum, implement the suggestions in our next comment below. The broader

issue around receptacles can then be prioritized for discussion at workshops held for the next regular code cycle.

6. If the option for receptacles is retained, we recommend future-proofing the proposed requirements for Low Power Level 2 Electric Vehicle (EV) Charging receptacles to reduce the cost of future upgrades.

If Low Power Level 2 Electric Vehicle (EV) Charging Receptacles remain a part of CALGreen, we recommend that the code require these installations include 40-ampere minimum branch circuit conductors to enable future low-cost installation of higher power EVSE. Currently, most EVSE that can provide demand-responsive or vehicle-grid interactive features are at least 30-ampere equipment. As demand for EV charging grows, implementation of grid-side management strategies becomes increasingly necessary to meet these loads. Due to the lower capacity of Low Power Level 2 EVSE receptacle branch circuits (20 ampere), widescale adoption of this type of space could result in the installation of EV charging infrastructure that limits the peak power available for grid-side management or future higher-power ALMS implementations.

To address this issue, we recommend adding a requirement that the branch circuit wiring for any receptacle-based 208/240-volt EV Space be sized for a 40-ampere minimum branch circuit, even if the initial installed capacity (20-ampere circuit breaker and 20-ampere receptacle) is lower. Aligned with this 40-ampere readiness expectation, we recommend a raceway with no less than 1-inch (25 mm) diameter and that any on-site distribution transformers have sufficient capacity to supply at least 40 amperes to each EV space in the future. Having the expensive-to-change conductors future-proofed to 40 amperes (minimum) will reduce the cost of future upgrades in places where first cost is driving installation of a receptacle rather than EVSE, ensuring that parking lots and communities where receptacles are installed can participate in future grid support activities without incurring additional significant costs to replace the underlying infrastructure.

To implement this recommendation, we suggest the following modified definition for Low Power Level 2 Electric Vehicle (EV) Charging Receptacle:

LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. A 208/240-volt ~~20-ampere minimum branch circuit and a receptacle for use by an EV driver to charge their electric vehicle or hybrid electric vehicle.~~ 20-ampere minimum circuit breaker, 40-ampere minimum branch circuit conductors, and a receptacle sized to match the circuit breaker.

We further recommend BSC adopt the HCD 45-day language describing specific receptacles into Section 5.106.5.3.2.2 (Proposed change to 4.106.4.2.2 in HCD Express Terms):

208/240V EVSE Receptacles shall comply with one of the following configurations:

- i. For 20-ampere receptacles, NEMA 6-20R
- ii. For 30-ampere receptacles, NEMA 14-30R
- iii. For 50-ampere receptacles, NEMA 14-50R

These changes are critical to ensure that receptacles installed between the effective date of these changes and the next code effective date have the capability of being upgraded to more advanced charges with minimal infrastructure changes needed. Otherwise, the code risks stranding these receptacles as technologies change and as charging infrastructure becomes more grid-flexible. Therefore, we encourage BSC and HCD to make these changes for receptacles now, during this 2022 intervening code cycle.

7. Data should be collected on when and how exceptions are used to inform future code changes and programs.

Sections 5.106.5.3, 5.106.5.4, and 4.106.4.2.2 contain exceptions for local governments to waive certain requirements to install EVSE or EV Spaces. Without visibility into how often these exceptions are invoked and how many opportunities to install EVSE or EV Spaces are foregone, it is difficult to understand whether there are any underlying issues that can be addressed through other code changes, through improvements in technology or outreach, or through new programs. We encourage BSC, HCD, and DSA to discuss with the public and with local governments ways that these agencies can collect data on each exception circumstance, track the quantity of EV Spaces not installed due to each exception, and to publish that data to increase visibility into underlying issues with expanding EV charging infrastructure. This discussion should occur as early as possible in workshops for the next regular code cycle.

8. We recommend that requirements distinguish between additions and alterations to the building versus to the parking.

The requirements in section 4.106.4.3 should distinguish between additions/alterations to the *building* versus additions/alterations to the *parking*. Parking space additions should be considered new construction under CALGreen and drive higher requirements (e.g., 40 percent of the new spaces). This is because it would likely be cost effective to link specific elements of an EV

charging retrofit to the activities required during different types of parking additions or alterations. For example, when resurfacing a parking lot with no corresponding electrical work, it may be cost effective for the same team to dig the trenches and bury the conduit, greatly simplifying a future EV charging upgrade.

We also recommend allowing ALMS to be used for code-required EV Spaces for existing building projects. With ALMS, more buildings would be allowed to comply with these existing building requirements without expensive upgrades to their electrical service.

These recommendations may require further discussion, so we encourage BSC, HCD, and DSA to include these issues in their workshops for the next regular code cycle.

9. We recommend adding the term “minimum” to the definition of Level 2 Electric Vehicle Supply Equipment (EVSE) and other clarifications.

We suggest that HCD and BSC update the definition of LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT to add the term “minimum” to build flexibility into the definition for branch circuit amperage and to remove duplicative language that is the basis of the definition for “Electric Vehicle Supply Equipment.” With these changes, the definition would read:

~~LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).~~ LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). An EVSE supplied by a ~~The 208/240 Volt 40-ampere~~ minimum ~~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.~~

Although we recommend deleting the similar term “Level 2 Electric Vehicle (EV) Charger,” if that term is retained, we would recommend making similar edits to that definition as well, especially including the term “minimum.” These proposed changes would increase clarity by removing unnecessary text defined elsewhere (point 6 of the Nine-Point Criteria) and adding the term “minimum” will help improve building performance (point 3 of the Nine-Point Criteria). Adding the term “minimum” can be easily implemented in this intervening code cycle update, and would help future-proof these installations, making it easier to upgrade them, at lower cost, with newer technologies and grid-flexible EVSE.

10. We recommend clarifying the power allocation method requirements.

We appreciate BSC's efforts to improve the clarity of the code by adding Table 5.106.5.3.6, Table A5.106.5.3.2 Tier 1, and Table A5.106.5.3.4 Tier 2. However, these tables now have a column (column 2) that is effectively meaningless since it says the same thing as column 3. We therefore suggest BSC eliminate column 2 from each of these tables.

To further improve clarity, since 6.6 kVA is a *continuous* charging capacity (40-ampere branch circuit derated for continuous duty by 80% x lower supply voltage 208V = ~6.6kW), we recommend column 3 heading read:

"MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1, 2}, OR DCFC"

If BSC retains column two, then we suggest the heading also include the term "Continuous" and further recommend that the language, "Total required kVA =P x .20 x 6.6, Where P=Parking spaces in facility," which is used in the last cell of column three, also be used in column two. We think these changes should be easy to implement in this intervening code cycle and would greatly improve the clarity of the regulations; however, if this is not prioritized for updating now, then we encourage BSC, HCD, and DSA to include this issue in its workshops for the next regular code cycle.

In conclusion, we would like to reiterate our support for BSC, DSA, and HCD in making updates to support future EV charging infrastructure. We thank BSC, DSA, and HCD staff for the opportunity to be involved in this process.

If you have any questions, please do not hesitate to reach out to the following contacts:

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Sincerely,
California Statewide Utility Codes and Standards Team

APPENDIX A

California Statewide Codes and Standards Team, Proposed Code Changes Using Commission Action Matrix, 45-day public comment period

2022 CALIFORNIA GREEN BUILDING STANDARDS CODE, TITLE 24, PART 11
 AGENCY: CALIFORNIA BUILDING STANDARDS COMMISSION (BSC 04/22)

ITEM 1 CHAPTER 2, SECTION 202 – DEFINITIONS (ELECTRIC VEHICLE RELATED)

Item Number 1	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
BSC 04/22-1-1	<u>ELECTRIC VEHICLE (EV) CHARGER</u>	Delete or Amend	2(b)	ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG] Off-board charging equipment used to charge an electric vehicle. <i>Alternatively:</i> ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG] Off-board charging equipment used to charge an electric vehicle. An EVSE.	6
BSC 04/22-1-2	<u>ELECTRIC VEHICLE CHARGING STATION (EVCS)</u>	Delete and Amend definition for EV Space	2(a)	ELECTRIC VEHICLE CHARGING STATION (EVCS). [BSC-CG] One or more electric vehicle charging spaces served by EVSE or receptacle(s). ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). [HCD] A space intended for <u>the</u> future installation of EV charging equipment <u>and</u> charging of electric vehicles, <u>that is</u> equipped with an EVSE or <u>equipped as EV Capable or EV Ready.</u>	6
BSC 04/22-1-3	<u>ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)</u>	None			
BSC 04/22-1-4	<u>LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER</u>	Delete or Amend	2(b)	LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG] A 208/240-volt 30-ampere minimum electric vehicle charger connected to the premises electrical system capable of charging electric vehicles. <i>Alternatively:</i> LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER. [BSC-CG] A 208/240-volt 30-ampere minimum electric vehicle charger connected to the premises electrical system capable of charging electric vehicles. A Level 2 EVSE.	6

Item Number 1	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
BSC 04/22-1-5	<u>LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT</u>	Amend	9	<u>LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).</u> [BSC-CG] An EVSE supplied by a The 208/240 Volt 40-ampere minimum 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.	3, 6
BSC 04/22-1-6	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE</u>	Amend	6	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. [BSC-CG]</u> A 208/240 Volt 20-ampere minimum branch circuit and a receptacle, 20-ampere minimum circuit breaker, 40-ampere minimum branch circuit conductors, and a receptacle sized to match the circuit breaker.	3, 5
New Item	<u>Electric Vehicle (EV) Ready Space [HCD]</u>	Amend	2(c)	<u>ELECTRIC VEHICLE (EV) READY SPACE. [HCD]</u> 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 junction box a charger.	7
New Item	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)</u>	Add	5	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).</u> A Level 2 EVSE supplied by a 20-ampere minimum circuit breaker and a 40-ampere minimum branch circuit conductors, where the EVSE is configured to match the circuit breaker.	3, 5

ITEMS 2-4.

No recommended changes.

ITEM 5 CHAPTER 5, NONRESIDENTIAL MANDATORY MEASURES, DIVISION 5.1- PLANNING AND DESIGN, SECTION 5.106 - SITE DEVELOPMENT

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
BSC 04/22-5-1	5.106.5.3	Amend	2(a)	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 <u>EV capable spaces</u> , Section 5.106.5.3.2 Electric vehicle charging stations <u>EV Spaces</u> and associated Table 5.106.5.3.1, or Section 5.106.5.3.6 Electric vehicle charging stations (EVCS) <u>EV Spaces-Power allocation method</u> and associated Table 5.106.5.3.6 and shall be provided in accordance with regulations in the California Building Code and the California Electrical Code.	6
BSC 04/22-5-2	5.106.5.3.2	Amend	2(a), 4	5.106.5.3.2 Electric vehicle charging stations (EVCS) space (EV Space) with EVSE. EV a Capable a Spaces shall be provided with electric vehicle supply equipment (EVSE) to create EVCS <u>EV Spaces with EVSE</u> in the number indicated in Table 5.106.5.3.1. The EVCS <u>EV Spaces with EVSE</u> required by Table 5.106.5.3.1 may shall be provided with <u>Level 2 EVSE or DCFC as permitted in Section 5.106.5.3.2.1. in any combination of Level 2 and Direct Current Fast Charging (DCFC), except that at least one Level 2 EVSE shall be provided.</u> <u>At least one Level 2 EVSE shall be provided.</u> One EV charger <u>EVSE</u> 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 a Capable a Space is accumulatively supplied to the EV charger <u>EVSE</u> .	3, 6
BSC 04/22-5-3	<u>5.106.5.3.2.1</u>	Amend	2(a), 4	The installation of each DCFC EVSE shall be permitted to reduce the minimum number of required EV capable spaces without <u>EV Spaces with EVSE</u> or EVCS with Level 2 EVSE by five and reduce proportionally the required electrical load capacity to the service panel or subpanel.	3, 6

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
BSC 04/22-5-4	<u>5.106.5.3.2.2</u>	Amend	2(a), 5, 6	<p>The installation of two Low Power Level 2 EV charging EVSEs receptacles shall be permitted to reduce the minimum number of required EV eCapable eSpaces without EVSE in Table 5.106.5.3.1 by one.</p> <p><i>Alternatively:</i> The installation of two Low Power Level 2 EV charging EVSE receptacles shall be permitted to reduce the minimum number of required EV eCapable eSpaces without EVSE in Table 5.106.5.3.1 by one. 208/240V EVSE Receptacles shall comply with one of the following configurations:</p> <ul style="list-style-type: none"> i. <u>For 20-ampere receptacles, NEMA 6-20R</u> ii. <u>For 30-ampere receptacles, NEMA 14-30R</u> iii. <u>For 50-ampere receptacles, NEMA 14-50R</u> 	3, 5, 6
New Item	5.106.5.3.3	Amend	2(a)	ALMS shall be permitted for EVCS EV Spaces . When ALMS is installed, the required electrical load capacity specified in Section 5.106.5.3.1 for each EVCS EV Space may be reduced when serviced by an EVSE controlled by an ALMS. Each EVSE controlled by an ALMS shall deliver a minimum of 30 amperes to an EV when charging one vehicle and shall deliver a minimum 3.3 kW while simultaneously charging multiple EVs.	6
BSC 04/22-5-5	5.106.5.3.4	Amend	2(a)	Accessible electric vehicle charging station (EVCS) EV Space. When EVSE is installed, accessible EVCS EVSE Spaces shall be provided in accordance with the California Building Code Chapter 11B Section 11B-228.3.	6
BSC 04/22-5-6	Note	None			
BSC 04/22-5-7	<u>5.106.5.3.5</u>	None			

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria																																				
BSC 04/22-5-8	Table 5.106.5.3.1	Amend	2(d)	<p style="text-align: center;">TABLE 5.106.5.3.1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%; text-align: center;">TOTAL NUMBER OF ACTUAL PARKING SPACES</th> <th style="width: 25%; text-align: center;"><u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u></th> <th style="width: 25%; text-align: center;">NUMBER OF REQUIRED EV CAPABLE SPACES (WITHOUT TERMINATING IN A RECEPTACLE OR EVSE)</th> <th style="width: 25%; text-align: center;">NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) ^{2 & 3}</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0-9</td> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">10-25</td> <td></td> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">26-50</td> <td></td> <td style="text-align: center;">8</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">51-75</td> <td></td> <td style="text-align: center;">13</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">76-100</td> <td></td> <td style="text-align: center;">17</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">101-150</td> <td></td> <td style="text-align: center;">25</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;">151-200</td> <td></td> <td style="text-align: center;">35</td> <td style="text-align: center;">9</td> </tr> <tr> <td style="text-align: center;">201 and over</td> <td></td> <td style="text-align: center;">20 percent of total actual parking spaces ¹</td> <td style="text-align: center;">25 percent of EV capable spaces ¹</td> </tr> </tbody> </table> <p>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.</p>	TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	NUMBER OF REQUIRED EV CAPABLE SPACES (WITHOUT TERMINATING IN A RECEPTACLE OR EVSE)	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 total actual parking spaces ¹	25 percent of EV capable spaces ¹	6
TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	NUMBER OF REQUIRED EV CAPABLE SPACES (WITHOUT TERMINATING IN A RECEPTACLE OR EVSE)	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) ^{2 & 3}																																						
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151-200		35	9																																						
201 and over		20 percent of total actual parking spaces ¹	25 percent of EV capable spaces ¹																																						

Item Number 5	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria
BSC 04/22-5-9	<u>5.106.5.3.6</u>	Amend	2(a)	<p>Electric vehicle charging stations (EVCS)<u>EV Space-Power allocation method.</u> The Power allocation method may be used as an alternative to the requirements in 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.</p> <p>Power allocation method to create EVCS <u>EV Spaces</u> shall include the following:</p> <ol style="list-style-type: none"> 1. <u>Use any kVA combination of EV eCapable eSpaces, Low Power Level 2, Level 2 or DCFC EVSEs.</u> 2. <u>At least one Level 2 EVSE shall be provided.</u> 3. <u>EV eCapable eSpaces shall meet the requirements of Section 5.106.5.3.1 EV eCapable eSpaces.</u> 	6

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria																											
BSC 04/22-5-10	Table 5.106.5.3.6 w/ footnotes	Amend	10	<p align="center">TABLE 5.106.5.3.6</p> <table border="1"> <thead> <tr> <th data-bbox="886 245 1152 370">TOTAL NUMBER OF ACTUAL PARKING SPACES</th> <th data-bbox="1152 245 1419 305">MINIMUM TOTAL kVA @ 6.6 kVA</th> <th data-bbox="1419 245 1686 488">MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1, 2}, OR DCFC</th> </tr> </thead> <tbody> <tr> <td align="center"><u>0-9</u></td> <td align="center"><u>0</u></td> <td align="center"><u>0</u></td> </tr> <tr> <td align="center"><u>10-25</u></td> <td align="center"><u>26.4</u></td> <td align="center"><u>26.4</u></td> </tr> <tr> <td align="center"><u>26-50</u></td> <td align="center"><u>52.8</u></td> <td align="center"><u>52.8</u></td> </tr> <tr> <td align="center"><u>51-75</u></td> <td align="center"><u>85.8</u></td> <td align="center"><u>85.8</u></td> </tr> <tr> <td align="center"><u>76-100</u></td> <td align="center"><u>112.2</u></td> <td align="center"><u>112.2</u></td> </tr> <tr> <td align="center"><u>101-150</u></td> <td align="center"><u>165</u></td> <td align="center"><u>165</u></td> </tr> <tr> <td align="center"><u>151-200</u></td> <td align="center"><u>231</u></td> <td align="center"><u>231</u></td> </tr> <tr> <td align="center"><u>201 and over</u></td> <td align="center"><u>20 percent of actual parking spaces x 6.6</u></td> <td align="center">Total required kVA = P x .20 x 6.6 Where P=Parking spaces in facility</td> </tr> </tbody> </table> <p>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 75 percent.</p>	TOTAL NUMBER OF ACTUAL PARKING SPACES	MINIMUM TOTAL kVA @ 6.6 kVA	MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1, 2}, OR DCFC	<u>0-9</u>	<u>0</u>	<u>0</u>	<u>10-25</u>	<u>26.4</u>	<u>26.4</u>	<u>26-50</u>	<u>52.8</u>	<u>52.8</u>	<u>51-75</u>	<u>85.8</u>	<u>85.8</u>	<u>76-100</u>	<u>112.2</u>	<u>112.2</u>	<u>101-150</u>	<u>165</u>	<u>165</u>	<u>151-200</u>	<u>231</u>	<u>231</u>	<u>201 and over</u>	<u>20 percent of actual parking spaces x 6.6</u>	Total required kVA = P x .20 x 6.6 Where P=Parking spaces in facility	6
TOTAL NUMBER OF ACTUAL PARKING SPACES	MINIMUM TOTAL kVA @ 6.6 kVA	MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1, 2}, OR DCFC																														
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ITEMS 6-17.
No recommended changes.

ITEM 18 APPENDIX A5, NONRESIDENTIAL VOLUNTARY MEASURES, DIVISION A5.1 - PLANNING AND DESIGN, SECTION A5.106 SITE DEVELOPMENT

Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria
BSC 04/22-18-1	A5.106.5.3	None			
BSC 04/22-18-2	A5.106.5.3.1 Tier 1	Amend	2(a)	<p>A5.106.5.3.1 Tier 1. Comply with Section 5.106.5.3.1 EV eCapable eSpaces. Section 5.106.5.3.2 Electric vehicle charging stations EV Spaces and associated Table A5.106.5.3.1 Tier 1, or comply with Section A5.106.5.3.2 Electric vehicle charging stations (EVCS) EV Space-Power allocation method and associated Table A5.106.5.3.2 Tier 1. Table A5.106.5.3.1 shall be used to determine the number of EV capable spaces required. Refer to Section 5.106.5.3 for design space requirements.</p> <p>When EV capable spaces are provided with EVSE to create EVCS per Table A5.106.5.3.1, r Refer to Section 5.106.5.3.2 for the allowed permitted use of Level 2 or Direct Current Fast Charger (DCFC) to create EV Spaces with EVSE. Refer to Section 5.106.3.2.1 for the allowed use of DCFC to comply with both EV eCapable eSpaces and Level 2 EVSE. and Refer to Section 5.106.5.3.3 for the allowed use of Automatic Load Management System (ALMS).</p>	6

Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria																																				
BSC 04/22-18-3	Table A5.106.5.3.1 <u>Tier 1</u>	Amend	2(d)	<p style="text-align: center;">TABLE A5.106.5.3.1 Tier 1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">TOTAL NUMBER OF ACTUAL PARKING SPACES</th> <th style="width: 25%;"><u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u></th> <th style="width: 25%;">TIER 1 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u></th> <th style="width: 25%;">TIER 1 NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES^{2,3}</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0-9</td> <td></td> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">10-25</td> <td></td> <td style="text-align: center;">5</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">26-50</td> <td></td> <td style="text-align: center;">11</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">51-75</td> <td></td> <td style="text-align: center;">19</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;">76-100</td> <td></td> <td style="text-align: center;">26</td> <td style="text-align: center;">9</td> </tr> <tr> <td style="text-align: center;">101-150</td> <td></td> <td style="text-align: center;">38</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">151-200</td> <td></td> <td style="text-align: center;">53</td> <td style="text-align: center;">18</td> </tr> <tr> <td style="text-align: center;">201 and over</td> <td></td> <td style="text-align: center;">30 percent of <u>actual total</u> parking spaces¹</td> <td style="text-align: center;">33 percent of EV capable spaces¹</td> </tr> </tbody> </table> <p>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. <u>At least one Level 2 EVSE shall be provided.</u></p>	TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	TIER 1 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u>	TIER 1 NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES ^{2,3}	0-9		2	0	10-25		5	2	26-50		11	4	51-75		19	6	76-100		26	9	101-150		38	13	151-200		53	18	201 and over		30 percent of <u>actual total</u> parking spaces ¹	33 percent of EV capable spaces ¹	6
TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	TIER 1 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u>	TIER 1 NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES ^{2,3}																																						
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Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria
BSC 04/22- 18-4	<u>A5.106.5.3.2</u>	Amend	2(a)	<p>Electric vehicle charging stations (EVCS)<u>EV Space-Power allocation method.</u> The Power allocation method may be used as an alternative to the requirements in Section 5.106.5.3.2 and associated Table A5.106.5.3.1 Tier 1. Use Table A5.106.5.3.2 Tier 1 to determine the total power in kVA required based on the total number of actual parking spaces.</p> <p>Power allocation method to create EVCS EV Spaces shall include the following:</p> <ol style="list-style-type: none"> 1. <u>Use any kVA combination of EV eCapable eSpaces, Low Power Level 2, Level 2 or DCFC EVSEs.</u> 2. <u>At least one Level 2 EVSE shall be provided.</u> 3. <u>EV eCapable eSpaces shall meet the requirements of Section 5.106.5.3.1 EV eCapable eSpaces.</u> 	6

Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria																											
BSC 04/22- 18-5	<u>Table</u> <u>A5.106.5.3.2</u> <u>Tier 1</u>	Amend	10	<p style="text-align: center;"><u>TABLE A5.106.5.3.2 Tier 1</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="886 245 1150 370"><u>TOTAL NUMBER OF ACTUAL PARKING SPACES</u></th> <th data-bbox="1150 245 1415 337"><u>MINIMUM TOTAL kVA @ 6.6 kVA</u></th> <th data-bbox="1415 245 1688 521"><u>MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE ³ LOW POWER LEVEL 2 LEVEL 2 ^{1,2}, OR DCFC</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="886 521 1150 561">0-9</td> <td data-bbox="1150 521 1415 561">13.2</td> <td data-bbox="1415 521 1688 561">13.2</td> </tr> <tr> <td data-bbox="886 561 1150 602">10-25</td> <td data-bbox="1150 561 1415 602">33</td> <td data-bbox="1415 561 1688 602">33</td> </tr> <tr> <td data-bbox="886 602 1150 643">26-50</td> <td data-bbox="1150 602 1415 643">72.6</td> <td data-bbox="1415 602 1688 643">72.6</td> </tr> <tr> <td data-bbox="886 643 1150 683">51-75</td> <td data-bbox="1150 643 1415 683">125.4</td> <td data-bbox="1415 643 1688 683">125.4</td> </tr> <tr> <td data-bbox="886 683 1150 724">76-100</td> <td data-bbox="1150 683 1415 724">171.6</td> <td data-bbox="1415 683 1688 724">171.6</td> </tr> <tr> <td data-bbox="886 724 1150 764">101-150</td> <td data-bbox="1150 724 1415 764">250.8</td> <td data-bbox="1415 724 1688 764">250.8</td> </tr> <tr> <td data-bbox="886 764 1150 805">151-200</td> <td data-bbox="1150 764 1415 805">349.8</td> <td data-bbox="1415 764 1688 805">349.8</td> </tr> <tr> <td data-bbox="886 805 1150 1016">201 and over</td> <td data-bbox="1150 805 1415 959">30 percent of actual parking spaces x 6.6</td> <td data-bbox="1415 805 1688 1016">Total required kVA =P x .30 x 6.6 Where P=Parking spaces in facility</td> </tr> </tbody> </table> <p data-bbox="869 1052 1667 1170">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 67 percent.</p>	<u>TOTAL NUMBER OF ACTUAL PARKING SPACES</u>	<u>MINIMUM TOTAL kVA @ 6.6 kVA</u>	<u>MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE ³ LOW POWER LEVEL 2 LEVEL 2 ^{1,2}, OR DCFC</u>	0-9	13.2	13.2	10-25	33	33	26-50	72.6	72.6	51-75	125.4	125.4	76-100	171.6	171.6	101-150	250.8	250.8	151-200	349.8	349.8	201 and over	30 percent of actual parking spaces x 6.6	Total required kVA =P x .30 x 6.6 Where P=Parking spaces in facility	6
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Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria
BSC 04/22- 18-6	A5.106.5.3.2 3 Tier 2	Amend	2(a)	<p>Comply with Section 5.106.5.3.1 EV eCapable eSpaces, Section 5.106.5.3.2 Electric vehicle charging stations EV Spaces and associated Table A5.106.5.3.3 Tier 2, or Section A5.106.5.3.4 Electric vehicle charging stations (EVCS) EV Space-Power allocation method and associated Table A5.106.5.3.4 Tier 2. Table A5.106.5.3.2 shall be used to determine the number of EV capable spaces required. Refer to Section 5.106.5.3 for design requirements.</p> <p>When EV capable spaces are provided with EVSE to create EVCS per Table A5.106.5.3.2, r Refer to Section 5.106.5.3.2 for the allowed permitted use of Level 2 or Direct Current Fast Charger (DCFC) to create EVCS EV Spaces with EVSE. Refer to Section 5.106.3.2.1 for the allowed use of DCFC to comply with both EV eCapable eSpaces and Level 2 EVSE. and Refer to Section 5.106.5.3.3 for the allowed use of Automatic Load Management System (ALMS).</p>	6

Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria																																				
BSC 04/22-18-7	Table A5.106.5.3.2 3 Tier 2	Amend	2(d)	<p style="text-align: center;">TABLE A5.106.5.3.2-3 Tier 2</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="871 264 1060 602">TOTAL NUMBER OF ACTUAL PARKING SPACES</th> <th data-bbox="1060 264 1249 602"><u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u></th> <th data-bbox="1249 264 1438 602">TIER 2 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u></th> <th data-bbox="1438 264 1627 602">TIER 2 NUMBER OF EVCS <u>(EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES</u> ^{2,3}</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0-9</td> <td></td> <td style="text-align: center;">3</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">10-25</td> <td></td> <td style="text-align: center;">8</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">26-50</td> <td></td> <td style="text-align: center;">17</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;">51-75</td> <td></td> <td style="text-align: center;">28</td> <td style="text-align: center;">9</td> </tr> <tr> <td style="text-align: center;">76-100</td> <td></td> <td style="text-align: center;">40</td> <td style="text-align: center;">13</td> </tr> <tr> <td style="text-align: center;">101-150</td> <td></td> <td style="text-align: center;">57</td> <td style="text-align: center;">19</td> </tr> <tr> <td style="text-align: center;">151-200</td> <td></td> <td style="text-align: center;">79</td> <td style="text-align: center;">26</td> </tr> <tr> <td style="text-align: center;">201 and over</td> <td></td> <td style="text-align: center;">45 percent of total-actual parking spaces¹</td> <td style="text-align: center;">33 percent of EV capable spaces¹</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 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. <u>At least one Level 2 EVSE shall be provided.</u> 	TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	TIER 2 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u>	TIER 2 NUMBER OF EVCS <u>(EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES</u> ^{2,3}	0-9		3	0	10-25		8	3	26-50		17	6	51-75		28	9	76-100		40	13	101-150		57	19	151-200		79	26	201 and over		45 percent of total-actual parking spaces ¹	33 percent of EV capable spaces ¹	6
TOTAL NUMBER OF ACTUAL PARKING SPACES	<u>NUMBER OF REQUIRED EV SPACES (ALL TYPES)</u>	TIER 2 NUMBER OF REQUIRED EV CAPABLE SPACES <u>(WITHOUT TERMINATI NG IN A RECEPTAC LE OR EVSE)</u>	TIER 2 NUMBER OF EVCS <u>(EV CAPABLE SPACES PROVIDED WITH EVSE EVSE SPACES</u> ^{2,3}																																						
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Item Number 18	Code Section	CASE Team Recommend ation	Comment Number	Proposed Text	Criteria
BSC 04/22- 18-8	<u>A5.106.5.3.4</u>	Amend	2(a)	<p>Electric vehicle charging stations (EVCS)<u>EV Space-Power allocation method.</u> The Power allocation method may be used as an alternative to the requirements in Section 5.106.5.3.2 and associated Table A5.106.5.3.3 Tier 2. Use Table A5.106.5.3.4 Tier 2 to determine the total power in kVA required based on the total number of actual parking spaces.</p> <p>Power allocation method to create <u>EV Spaces</u> shall include the following:</p> <ol style="list-style-type: none"> 1. <u>Use any kVA combination of EV eCapable eSpaces, Low Power Level 2, Level 2 or DCFC EVSEs.</u> 2. <u>At least one Level 2 EVSE shall be provided.</u> 3. <u>EV eCapable eSpaces shall meet the requirements of Section 5.106.5.3.1 EV eCapable eSpaces.</u> 	6

Item Number 18	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria																											
BSC 04/22-18-9	<u>Table A5.106.5.3.4 Tier 2</u>	Amend	10	<p style="text-align: center;"><u>TABLE A5.106.5.3.4 Tier 2</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;"><u>TOTAL NUMBER OF ACTUAL PARKING SPACES</u></th> <th style="width: 33%;"><u>MINIMUM TOTAL kVA @ 6.6 kVA</u></th> <th style="width: 33%;"><u>MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1,2}, OR DCFC</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><u>0-9</u></td> <td style="text-align: center;">28.8</td> <td style="text-align: center;">28.8</td> </tr> <tr> <td style="text-align: center;"><u>10-25</u></td> <td style="text-align: center;">76.8</td> <td style="text-align: center;">76.8</td> </tr> <tr> <td style="text-align: center;"><u>26-50</u></td> <td style="text-align: center;">163.2</td> <td style="text-align: center;">163.2</td> </tr> <tr> <td style="text-align: center;"><u>51-75</u></td> <td style="text-align: center;">268.8</td> <td style="text-align: center;">268.8</td> </tr> <tr> <td style="text-align: center;"><u>76-100</u></td> <td style="text-align: center;">384</td> <td style="text-align: center;">384</td> </tr> <tr> <td style="text-align: center;"><u>101-150</u></td> <td style="text-align: center;">547.2</td> <td style="text-align: center;">547.2</td> </tr> <tr> <td style="text-align: center;"><u>151-200</u></td> <td style="text-align: center;">758.4</td> <td style="text-align: center;">758.4</td> </tr> <tr> <td style="text-align: center;"><u>201 and over</u></td> <td style="text-align: center;">45 percent of actual parking spaces x 6.6</td> <td style="text-align: center;">Total required kVA = P x .45 x P x 6.6 Where P=Parking spaces in facility</td> </tr> </tbody> </table> <p style="margin-left: 40px;">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 67 percent.</p>	<u>TOTAL NUMBER OF ACTUAL PARKING SPACES</u>	<u>MINIMUM TOTAL kVA @ 6.6 kVA</u>	<u>MINIMUM TOTAL CONTINUOUS kVA REQUIRED IN ANY COMBINATION OF EV CAPABLE³, LOW POWER LEVEL 2, LEVEL 2^{1,2}, OR DCFC</u>	<u>0-9</u>	28.8	28.8	<u>10-25</u>	76.8	76.8	<u>26-50</u>	163.2	163.2	<u>51-75</u>	268.8	268.8	<u>76-100</u>	384	384	<u>101-150</u>	547.2	547.2	<u>151-200</u>	758.4	758.4	<u>201 and over</u>	45 percent of actual parking spaces x 6.6	Total required kVA = P x .45 x P x 6.6 Where P=Parking spaces in facility	6
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ITEMS 19-27.

No recommended changes.

ITEM 1 CHAPTER 2, SECTION 202 – DEFINITIONS

Item Number 1	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-1-1	ELECTRIC VEHICLE CHARGING STATION (EVCS)	Amend	2(a)	<p>ELECTRIC VEHICLE CHARGING STATION (EVCS). [HCD] One or more electric vehicle charging spaces served by <u>EVSE or receptacle(s), electric vehicle charger(s) or other charging equipment</u> allowing charging of electric vehicles. Electric vehicle charging stations are not considered parking spaces.</p> <p>ELECTRIC VEHICLE CHARGING SPACE (EV SPACE). [HCD] A space intended for the future installation of EV charging equipment and charging of electric vehicles, <u>that is equipped with an EVSE or equipped as EV Capable or EV Ready.</u></p>	6
HCD 04/22-1-2	ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)	None			
HCD 04/22-1-3	LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)	Amend	9	<p>LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). [HCD] An EVSE supplied by a The 208/240 Volt 40-ampere <u>minimum</u> 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.</p>	3, 6
HCD 04/22-1-4	LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER	Delete or Amend	2(b)	<p>LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER. [HCD] A 208/240-volt 30-ampere minimum electric vehicle charger connected to the premises electrical system capable of charging electric vehicles.</p> <p><i>Alternatively:</i> LEVEL 2 ELECTRIC VEHICLE (EV) CHARGER. [HCD] A 208/240-volt 30-ampere minimum electric vehicle charger connected to the premises electrical system capable of charging electric vehicles. <u>A Level 2 EVSE.</u></p>	6

Item Number 1	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-1-5	LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE	Amend	6	LOW POWER LEVEL 2 ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE. [HCD] A 208/240-volt 20-ampere minimum branch circuit and a receptacle for use by an EV driver to charge their electric vehicle or hybrid electric vehicle 20-ampere minimum circuit breaker, 40-ampere minimum branch circuit conductors, and a receptacle sized to match the circuit breaker.	3, 5
New Item	ELECTRIC VEHICLE (EV) CHARGER	Delete or Amend	2(b)	ELECTRIC VEHICLE (EV) CHARGER. [HCD] Off board charging equipment used to charge an electric vehicle. <i>Alternatively:</i> ELECTRIC VEHICLE (EV) CHARGER. [HCD] Off board charging equipment used to charge an electric vehicle. <u>An EVSE.</u>	6
New Item	ELECTRIC VEHICLE (EV) READY SPACE [HCD]	Amend	2(c)	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 <u>junction box a charger.</u>	7
New Item	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)</u>	Add	5	<u>LOW POWER LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).</u> <u>A Level 2 EVSE supplied by a 20-ampere minimum circuit breaker and 40-ampere minimum branch circuit conductors, where the EVSE is configured to match the circuit breaker.</u>	3, 5

ITEMS 2-4.

No recommended changes.

ITEM 5 CHAPTER 4 RESIDENTIAL MANDATORY MEASURES, SECTION 4.106.4.2.2 MULTIFAMILY DEVELOPMENT PROJECTS WITH 20 OR MORE DWELLING UNITS, HOTELS AND MOTELS WITH 20 OR MORE SLEEPING UNITS OR GUEST ROOMS.

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-5-1	4.106.4.2.2 (title)	None			

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-5-2	4.106.4.2.2, Item 1. EV capable, Exception & Notes	None			
HCD 04/22-5-3	4.106.4.2.2, Item 2 1. EV Ready Parking Spaces with Receptacles, with Items 1a, 1b, 1c & 1d	Delete	5	(Receptacles as a compliance option should be eliminated.)	5

Item Number 5	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-5-4	4.106.4.2.2, Item 3 2. EV Ready Parking Spaces with EV Chargers. with Items 2a & 2b	Amend	2(a), 3	<p>3-2. EV Ready Parking Spaces with EV Chargers EVSE.</p> <p>a. Hotels and Motels. Five (5) <u>Ten (10)</u> percent of the total number of parking spaces shall be equipped with Level 2 EVSE <u>EV chargers</u>. Where common use parking is provided, at least one EV charger shall be located in the common use parking area and shall be available for use by all residents or guests. At least fifty (50) percent of the required EV chargers Level 2 EVSE shall be equipped with J1772 connectors.</p> <p>b. Multifamily Parking Facilities. <u>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.</u></p> <p>When <u>Where</u> low power Level 2 EVSE charging receptacles or Level 2 EVSE EVSE 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) EVSE served by the ALMS. The branch circuit shall have a minimum capacity of 40 amperes, and installed EVSE EV chargers EVSE shall have a capacity of not less than 30 amperes. ALMS shall not be used to reduce the minimum required electrical capacity to the required EV capable spaces.</p>	3, 5, 6

ITEM 6 CHAPTER 4 RESIDENTIAL MANDATORY MEASURES, SECTION 4.106.4.2.2.1 ELECTRIC VEHICLE CHARGING STATIONS (EVCS).

Item Number 6	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-6-1	4.106.4.2.2.1	Amend	2(a)	Electric vehicle charging stations (EVCS) space (EV Space). Electric vehicle charging stations spaces required by Section 4.106.4.2.2.1.2, Item 32, with EV chargers installed <u>EVSE</u> shall comply with Section 4.106.4.2.2.1.1.	6

ITEM 7.

No recommended changes.

ITEM 8 CHAPTER 4 RESIDENTIAL MANDATORY MEASURES, SECTION 4.106.4.2.2.1.2 ELECTRIC VEHICLE CHARGING STATIONS (EVCS) DIMENSIONS.

Item Number 8	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-8-1	4.106.4.2.2.1.2-1 w/ sub-items 1, 2, 3 w/ sub-items 3a & 3b & Exception	Amend	2(a)	<p><u>Electric vehicle charging stations (EVCS) spaces (EV Spaces) with EVSE chargers installed; dimensions and location.</u> The charging EVCS spaces <u>EV Spaces</u> shall be designed to comply with the following:</p> <ol style="list-style-type: none"> 1. The minimum length of each EVCS space <u>EV Space</u> shall be 18 feet (5486 mm). 2. The minimum width of each EVCS space <u>EV Space</u> shall be 9 feet (2743 mm). 3. One in every 25 charging EVCS spaces <u>EV Spaces</u>, but not less than one, shall also have an 8-foot (2438 mm) wide aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EVCS space <u>EV Space</u> is 12 feet (3658 mm). a. Surface slope for this EVCS space EV Space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction. These EVCS spaces EV Spaces shall also comply with at least one of the following: <ol style="list-style-type: none"> a. The EVCS space EV Space shall be located adjacent to an accessible parking space meeting the requirements of the California Building Code, Chapter 11A, to allow use of the EV charger from the accessible parking space. b. The EVCS space EV Space shall be located on an accessible route, as defined in the California Building Code, Chapter 2, to the building. <p><u>Exception: Electric vehicle charging stations EV Spaces with EVSE designed and constructed in compliance with the California Building Code, Chapter 11B, are not required to comply with Section 4.106.4.2.2.1.1.</u></p>	6

ITEM 9 CHAPTER 4 RESIDENTIAL MANDATORY MEASURES, SECTION 4.106.4.2.2.1.3 ACCESSIBLE EV SPACES.

Item Number 9	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-9-1	4.106.4.12.2.1.3-2	Amend	2(a)	Accessible EV electric vehicle charging station spaces EV Spaces. In addition to the requirements in Sections 4.106.4.2.2.1.1 and 4.106.4.2.2.1.2, all EVSE EV chargers EV Spaces , when where installed, shall comply with the accessibility provisions for EV chargers EV Spaces in the California Building Code, Chapter 11B. EV Spaces ready spaces and EVCS in multifamily developments shall comply with California Building Code, Chapter 11A, Section 1109A.	6

ITEMS 10-11.

No recommended changes.

ITEM 12 CHAPTER 4 RESIDENTIAL MANDATORY MEASURES, SECTION 4.106.4.3 ELECTRIC VEHICLE CHARGING FOR ADDITIONS AND ALTERATIONS OF PARKING FACILITIES SERVING EXISTING MULTIFAMILY BUILDINGS.

Item Number 12	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-12-1	4.106.4.3		8	(Clarify alterations/additions for parking lots; allow ALMS for code-required EV spaces in existing building projects)	5

ITEM 13.

No recommended changes.

ITEM 14 APPENDIX A4 RESIDENTIAL VOLUNTARY MEASURES, SECTION A4.106.8.2 NEW MULTIFAMILY DEVELOPMENT PROJECTS AND HOTELS AND MOTELS.

Item Number 14	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-14-1	A4.106.8.2	None			
HCD 04/22-14-2	A4.106.8.2.1, Tier 1 & Tier 2	None			

Item Number 14	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-14-3	<u>A4.106.8.2.1, Tier 1; Option A</u> <u>With sub-items 1a & 1b w/ Exceptions</u>	Delete	5	(Receptacles as a compliance option should be eliminated.)	5
HCD 04/22-14-4	<u>A4.106.8.2.1, Tier 1; Option A</u> <u>With sub-items 2a & 2b w/ Exception</u>	Amend	2(a)	<p><u>2. EV Ready Parking Spaces with EV ChargersEVSE.</u></p> <p>a. <u>Hotels and Motels.</u> Fifteen (15) percent of the total number of parking spaces for hotels and motels shall be equipped with Level 2 EV chargersEVSE. At least fifty (50) percent of the required Level 2 EV chargersEVSE shall be equipped with J1772 connectors.</p> <p>b. <u>Multifamily Parking Facilities.</u> Fifteen (15) percent of the total number of parking spaces shall be equipped with Level 2 EV chargersEVSE. At least fifty (50) percent of the required Level 2 EV chargersEVSE shall be equipped with J1772 connectors. Where common use parking or unassigned parking is provided, EV chargersEVSE shall be located in common use or unassigned parking areas and shall be available for use by all residents or guests.</p> <p><u>Exception:</u> 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.</p> <p><u>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 chargersEVSE shall have a capacity of not less than 30 amperes.</u></p>	6

Item Number 14	Code Section	CASE Team Recommendation	Comment Number	Proposed Text	Criteria
HCD 04/22-14-5	<u>A4.106.8.2.1, Tier 1; Option B</u> <u>With sub-items 1 w/ Exceptions & 2 w/ Exceptions</u>	Amend	2(a)	Similar to HCD 04/22-14-4 above.	6
HCD 04/22-14-6 (Revised)	<u>A4.106.8.2.1, Tier 2; Option A</u> <u>With sub-items 1a & 1b w/ Exceptions</u>	None			
HCD 04/22-14-7 (Revised)	<u>A4.106.8.2.1, Tier 2; Option A</u> <u>With sub-items 2a & 2b w/ Exceptions</u>	Amend	2(a)	Similar to HCD 04/22-14-4 above.	6
HCD 04/22-14-8 (Revised)	<u>A4.106.8.2.1, Tier 2; Option B</u> <u>With sub-items 1 w/ Exception & 2 w/ Exceptions</u>	Amend	2(a)	Similar to HCD 04/22-14-4 above.	6

ITEMS 15-16.

No recommended changes.