

DSA Code Amendment development

| Tracking |
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| Date Received: - |
| DSA Tracking Number: |
| Date Reviewed: 03/12/21 |
| Status: Under consideration |

| Applicable Code |
| --- |
| Applicable Code Section(s):  CALGreen Chapter 5  Section 5.106.5.3 |
| Topic:  Electric Vehicle Charging |

## Current Code Language

**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be in accor­dance with the *California Building Code,* the *California Electrical Code* and as follows:

**5.106.5.3.1 Single charging space requirements. [**N] When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.
3. The raceway shall not be less than trade size 1.”
4. The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.
5. The service panel or subpanel shall have sufficient capacity to accommodate a minimum of 40- ampere dedicated branch circuit for the future installation of the EVSE.

**5.106.5.3.2 Multiple charging space requirements**

When multiple charging spaces are required per Table 5.106.5.3.3 raceway(s) is/are is required to be installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Construction plans and specifications shall include, but are not limited to, the following:

1. The type and location of the EVSE.
2. The raceway(s) 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 charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent.
3. Plan design shall be based upon 40-ampere minimum branch circuit.
4. Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage.
5. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

**5.106.5.3.3. Charging space calculation**. [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.

**Exceptions:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.

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 5.106.5.3 may adversely impact the construction cost of the project.

**TABLE 5.106.5.3.3**

| **TOTAL NUMBER OF**  **ACTUAL PARKING SPACES** | **NUMBER OF REQUIRED EV CHARGING SPACES** |
| --- | --- |
| 0-9 | 0 |
| 10-25 | 2 |
| 26-50 | 3 |
| 51-75 | 5 |
| 76-100 | 7 |
| 101-150 | 10 |
| 151-200 | 14 |
| 201 and over | 8 percent of total1 |

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

**5.106.5.3.4 [N]** Identification. The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visible marked as “EV CAPABLE”.

**5.106.5.3.5 [N] Future charging spaces.** Future charging spaces qualify as designated parkingas described in Section 5/.106.5.2 Designated parking for clean air vehicles.

Note: Future electric vehicle charging spaces shall be considered parking spaces and shall count for the total parking spaces required by the local enforcing agencies.

## Suggested Text of Proposed Amendment

**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section5.106.5.3.1 and in accor­dance with regulations for electric vehicle charging in the *California Building Code and* the *California Electrical Code.* ~~or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE). When EVSE(s) is/are installed, it shall be~~ ~~in accor­dance with the~~ *~~California Building Code,~~* ~~the~~ *~~California Electrical Code~~* ~~and as follows:~~

**Exception:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

1. Where there is insufficient electrical supply.
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 5.106.5.3, may adversely impact the construction cost of the project.

**~~5.106.5.3.1 Single charging space requirements. [~~**~~N] When only a single charging space is required per Table 5.106.5.3.3, a raceway is required to be installed at the time of construction and shall be installed in accordance with the California Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:~~

1. ~~The type and location of the EVSE.~~
2. ~~A listed raceway capable of accommodating a 208/240-volt dedicated branch circuit.~~
3. ~~The raceway shall not be less than trade size 1.”~~
4. ~~The raceway shall originate at a service panel or a subpanel serving the area, and shall terminate in close proximity to the proposed location of the charging equipment and into a listed suitable cabinet, box, enclosure or equivalent.~~
5. ~~The service panel or subpanel shall have sufficient capacity to accommodate a minimum of 40- ampere dedicated branch circuit for the future installation of the EVSE.~~

**5.106.5.3.~~2~~ 1 ~~Multiple~~ ~~charging space requirements~~ EV Charging spaces (EV capable)**

When ~~multiple~~ charging spaces are required per Table 5.106.5.3.1 raceway~~(s) is/are~~ is required tobe installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. ~~Construction plans and specifications shall include, but are not limited to, the following:~~ Each required EV capable space shall have the following minimum requirements:

~~1.The type and location of the EVSE.~~

~~2~~ 1. The raceway(s) 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 charging equipment and into listed suitable cabinet~~(s)~~, box~~(es)~~, enclosure~~(s)~~ or equivalent. A common raceway can be used to serve multiple charging spaces.

~~3~~ 2. Panel capacity at time of construction for each charging space shall be ~~Plan design shall be based upon~~ a 208/240 volts, 40-ampere minimum branch circuit.

~~4~~ 3. ~~Electrical calculations shall substantiate the design of the electrical system, to include the rating of~~ The electrical system ~~equipment~~ and any on-site distribution transformers ~~and~~ shall have sufficient capacity to ~~charge~~ supply all required ~~EVs~~ EVSE at full rated amperage at each required charging space. ~~its full rated amperage.~~

~~5~~ 4. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.

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

**5.106.5.3.2 EV charging spaces with level 2 EVSE.**

EV capable charging spaces are required to be provided with level 2 EVSE as indicated by Table 5.106.3.1. When EVSE equipment is installed beyond the minimum required by Table 5.106.3.3, the following is permitted:

1. ALMS systems may be used to reduce the minimum required load capacity to each space served by the ALMS. ALMS must be designed to deliver at least 3.8 kW simultaneously to each EVCS space served by the ALMS and must meet the requirements of *California Electrical Code* Article 625. ALMS shall not be used to reduce the minimum required load capacity to EV capable spaces without EVSE equipment installed or to the minimum required EV charging spaces with EVSE required by Table 5.106.5.3.1.
2. Where six level 2 EVSE chargers are installed, one Direct Current Fast Charger (DCFC) can be installed to substitute for five Level 2 EVSE’s and reduce the load capacity to each space required by 5.106.5.3.1. The installed DCFC shall be rated at 80kW minimum.

**~~5.106.5.3.3. Charging space calculation~~**~~. [N] Table 5.106.5.3.3 shall be used to determine if single or multiple charging space requirements apply for the future installation of EVSE.~~

**~~Exceptions:~~** ~~On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:~~

~~1. Where there is insufficient electrical supply.~~

~~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 5.106.5.3 may adversely impact the construction cost of the project.~~

**~~TABLE 5.106.5.3.3~~**

| **~~TOTAL NUMBER OF~~**  **~~ACTUAL PARKING SPACES~~** | **~~NUMBER OF REQUIRED EV CHARGING SPACES~~** |
| --- | --- |
| ~~0-9~~ | ~~0~~ |
| ~~10-25~~ | ~~2~~ |
| ~~26-50~~ | ~~3~~ |
| ~~51-75~~ | ~~5~~ |
| ~~76-100~~ | ~~7~~ |
| ~~101-150~~ | ~~10~~ |
| ~~151-200~~ | ~~14~~ |
| ~~201 and over~~ | ~~8 percent of total~~~~1~~ |

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

**Table 5.106.5.3.1**

| **TOTAL NUMBER OF**  **ACTUAL PARKING SPACES** | **NUMBER OF REQUIRED EV CHARGING SPACES**  **(EV CAPABLE)** | **NUMBER OF REQUIRED EV CHARGING SPACES**  **(LEVEL 2 EVSE)** |
| --- | --- | --- |
| 0-9 | 0 | 0 |
| 10-25 | ~~2~~ 3 | 0 |
| 26-50 | ~~4~~ 6 | 2 |
| 51-75 | ~~7~~ 10 | 3 |
| 76-100 | ~~9~~ 14 | 4 |
| 101-150 | ~~13~~ 19 | 6 |
| 151-200 | ~~18~~ 26 | 9 |
| 201 and over | ~~10~~ 20% percent of total parking spaces1 | 25% of EV capable spaces |

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

**~~5.106.5.3.4 [N]~~** ~~Identification. The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visible marked as “EV CAPABLE”.~~

**~~5.106.5.3.5 [N] Future charging spaces.~~** ~~Future charging spaces qualify as designated parking~~~~as described in Section 5/.106.5.2 Designated parking for clean air vehicles.~~

Note: Future electric vehicle charging spaces shall be considered parking spaces and shall count for the total parking spaces required by the local enforcing agencies.

## Code Text if Adopted

**5.106.5.3 Electric vehicle (EV) charging. [N]** Construction shall comply with Section5.106.5.3.1 and in accor­dance with regulations for electric vehicle charging in the *California Building Code and* the *California Electrical Code.*

**Exception:** On a case-by-case basis where the local enforcing agency has determined EV charging and infrastructure is not feasible based upon one or more of the following conditions:

* 1. Where there is insufficient electrical supply.
  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 5.106.5.3, may adversely impact the construction cost of the project.

**5.106.5.3.1 EV Charging spaces (EV capable)**

When charging spaces are required per Table 5.106.5.3.1 raceway is required tobe installed at the time of construction and shall be installed in accordance with the *California Electrical Code*. Each required EV capable space shall have the following minimum requirements:

1. The raceway(s) 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 charging equipment and into listed suitable cabinet, box, enclosure or equivalent. A common raceway can be used to serve multiple charging spaces.
2. Panel capacity at time of construction for each charging space shall be a 208/240 volts, 40-ampere minimum branch circuit.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply all required EVSE at full rated amperage at each required charging space.
4. The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE.
5. Identification.The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective device space(s) for future EV charging as “EV CAPABLE”. The raceway termination location shall be permanently and visibly marked as “EV CAPABLE.

**5.106.5.3.2 EV charging spaces with level 2 EVSE.**

EV capable charging spaces are required to be provided with level 2 EVSE as indicated by Table 5.106.3.1. When EVSE equipment is installed beyond the minimum required by Table 5.106.3.3, the following is permitted:

1. ALMS systems may be used to reduce the minimum required load capacity to each space served by the ALMS. ALMS must be designed to deliver at least 3.8 kW simultaneously to each EVCS space served by the ALMS and must meet the requirements of *California Electrical Code* Article 625. ALMS shall not be used to reduce the minimum required load capacity to EV capable spaces without EVSE equipment installed or to the minimum required EV charging spaces with EVSE required by Table 5.106.5.3.1.
2. Where six level 2 EVSE chargers are installed, one Direct Current Fast Charger (DCFC) can be installed to substitute for five Level 2 EVSE’s and reduce the load capacity to each space required by 5.106.5.3.1. The installed DCFC shall be rated at 80kW minimum.

**Table 5.106.5.3.1**

| **TOTAL NUMBER OF**  **ACTUAL PARKING SPACES** | **NUMBER OF REQUIRED EV CHARGING SPACES**  **(EV CAPABLE)** | **NUMBER OF REQUIRED EV CHARGING SPACES**  **(LEVEL 2 EVSE)** |
| --- | --- | --- |
| 0-9 | 0 | 0 |
| 10-25 | 3 | 0 |
| 26-50 | 6 | 2 |
| 51-75 | 10 | 3 |
| 76-100 | 14 | 4 |
| 101-150 | 19 | 6 |
| 151-200 | 26 | 9 |
| 201 and over | 20% percent of total parking spaces1 | 25% of EV capable spaces |

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

Note: Future electric vehicle charging spaces shall be considered parking spaces and shall count for the total parking spaces required by the local enforcing agencies.

## Rationale

The California Building Standards Commission proposes, and the Division of the State Architect proposes to co-adopt mandatory measures to provide for an increase in EV capable spaces and for the installation of EVSE at EV capable spaces.

ALMS is used to reduce minimum load capacity to incentivize the installation of additional EVSE beyond the required minimum while able to reduce required minimum load capacity to each EV capable space when EVSE is installed at time of construction.

This incremental change in the mandatory provisions for K-12 public schools and community colleges will support functional EV charging in addition to EV infrastructure to support electric vehicle market penetration.

## DSA Comments

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