

# Guidelines for future Electric Vehicle Charging Stations at Alameda County Facilities

## Terms:

- **Electric Vehicle Supply Equipment (EVSE):** Charging stations and associated immediate infrastructure (e.g. transformers, etc.) excluding building electrical infrastructure such as electrical panels, conduit/raceways, overprotection devices, wires and pull boxes.
- **Level 2:** EVSE that operates on a 40-Amp 208 or 240-volt circuit and provides power between 3.3 and 7.2 kW.
- **Direct Current Fast Charger (DCFC):** EVSE that provides a minimum of 40 kW of power. Circuit requirements will change with charger power.
- **EV Readiness:** Parking structure and parking spots equipped with “make-ready” infrastructure to support the immediate and convenient installation of an EVSE, including electrical panels, conduit/raceways, overprotection devices, wires and pull boxes. The goal of EV Readiness is to prepare for the future installation of EVSE at minimum cost.
- **EV Capable:** Parking structure has the electrical panel capacity to provide EV charging but not necessarily the complete supporting infrastructure connecting the panels to the EV parking spot.

## Introduction

Pursuant to the California Green Building Standards Code (Title 24, Part 11, [Chapter 5](#)), all new construction must provide parking spaces and electrical infrastructure sufficient to support the future installation of Electric Vehicle Supply Equipment (EVSE)<sup>1</sup>. These guidelines provide a roadmap, beyond the minimum requirements, for new construction of County facilities that supports and continues the County’s role as a regional leader in both the adoption of EVs and the installation of EVSE.

GSA – Logistics Services is investing in EVSE to transition the County’s vehicle fleet to EVs and should be consulted on new projects. Beyond experience, Logistics Services may also have access to grant or local funds that assist in the expansion of EVSE, thereby reducing project cost.

These guidelines build upon GSA-Logistics Services’ expertise to expand on specific sections of Title 24 and provide useful details that are left open in existing code. These guidelines also discuss important additional considerations not addressed in Title 24.

## Applicability

These requirements apply to both new construction and significant renovations that include parking. Any project that involves resurfacing or excavating of a parking lot should be considered a “significant renovation”.

---

<sup>1</sup> See Appendix A for description of requirements under the California Green Building Standards.

## Goals of Guidelines

- **Future proof and reduce costs of fleet electrification by ensuring that all necessary charging infrastructure, such as conduit, is installed in locations that are difficult to access after construction is finished.**
- **Establish a system to consult GSA-Logistics throughout the design process to ensure that guidelines are being met and the existing expertise of County departments is being leveraged.**

## Summary of Guidelines

- Require that all new County buildings and any significant alterations, at locations with parking, be 100% EV capable and 10% EV Ready.
- Additionally require that EVSE be installed at the 10% of spots that are EV Ready **as a part of the project budget.**
- Provide an outline to allow full Level 2 charging at 20% of parking spaces or to utilize power management systems to provide lower Level 2 charging at 100% of parking spaces, constituting 100% EV Capability.

## Section A - EV Parking Spots Calculation & Framework for Installation

1. While Title 24 provides EV spot requirements and requires only 6% of spots be EV ready for parking lots above 201 spots, Logistics Services recommends that all new parking lots/garages or major renovations at current parking lots/garages **should prepare a minimum of 10% of spaces for EV Readiness and the remaining 90% to be EV Capable. Additionally, EVSE should be installed during project construction at the 10% of spots that are EV Ready.** Specific requirements can be found in the table below.

<b>Total Number of Parking Spaces</b>	<b>Number of Required EV Ready Spaces</b>
<50	4
>50	10%

*Note: Number of Required EV Ready spaces should be rounded up to the nearest whole number.*

2. The cost of the EVSE itself should be included in the project budget, in addition to the cost of making spots EV Ready and EV Capable and GSA-Logistics should be consulted to provide the latest EVSE specifications to guide installation
  - a. In some cases it may make sense for GSA-Logistics to manage the installation of the EVSE itself, using existing relationships with vendors under contract to minimize cost, either during or immediately following construction. Logistics has experience and expertise on what specific charger types and accompanying software is needed for a particular location.
3. In cases where installation of EVSE at EV Capable spots is not required at the time of construction, GSA-Logistics will manage installation and cover costs at future date.
4. In cases where meeting EV Readiness requirements is thought to be unreasonable or unnecessary given project specifics, an exemption may be possible **after consultation with GSA-Logistics.**

## **Section B - Spot Location**

1. EV parking spots should be located in preferred spots near entrances to encourage EV adoption and use. Preferred parking is a common method to incentivize behavior and is used to encourage other behaviors like carpooling.
2. Close proximity to electrical panels is another factor to consider because it will reduce the cost of EVSE installation in major remodels. It is less important in the context of new construction. Locating chargers near existing electric infrastructure reduces cost because it reduces the length of the necessary conduit/raceways, which are particularly expensive to install at existing facilities because they often require tunneling. However, if this conduit/raceway is being installed during construction, as is required by Title 24 and detailed in these guidelines, then it becomes less important because it is much less expensive.

## **Section C - EV Ready Spots - Raceway, Conduit, and Electrical Plan Requirements & Hardware – 10% of total parking spaces**

1. To ensure **EV Readiness** in new buildings or substantial demolition, remodeling or resurfacing projects, the following should be provided for **each spot**:
  - a. A 40-Amp 208 or 240-volt branch circuit, including raceway/conduit, electrical panel capacity, overprotection devices, wire, and pull boxes. Pull boxes should be located at or near the location of future charging stations so that contractors can easily pull wire from the control panels to the stations without the need to trench or add new conduit. Conduit shall be a minimum 1-inch inside diameter.
  - b. The current version of the charging station pedestal footing with anchor bolts in front of the parking spaces should be installed. An example for a bollard-mount CT4000 can be found in Appendix B.
  - c. A clearance of at least 20in should be provided between the end of the parking spot and the wall/other barrier to allow space for charger installation.
  - d. Any conduit/raceways, or other electrical infrastructure needed to install future EVSE planned for in EV capability requirements (see below), that would be costly to install after construction (e.g. conduit from basement electrical panels to an upper floor of a parking garage, that requires drilling) should be installed during construction at the time that EV Ready conduit is installed.

## **Section D - EV Capable Spots – Electrical Panel Requirements**

1. To ensure 100% **EV Capability** in new buildings or substantial demolition, remodeling or resurfacing projects the following shall be provided:
  - a. Electrical panel capacity for additional 40-Amp 208 or 240-volts branch circuits multiplied by minimum of 20% of the number of parking spaces. This will ensure that Level 2 EVSE operating at full capacity on a 40-amp circuit can charge a minimum of 20% of the total number of EV Spaces simultaneously, or that EVSE operating at 8-amps can charge at 100% of the spots simultaneously. Depending on the needs at a specific site, this excess panel capacity can be used to create a charging scenario with EVSE operating at, or

anywhere in between, the two scenarios outlined above. Power management systems are required to execute the 8-amps at 100% scenario and GSA – Logistics will lead the design and installation of any such system, when needed. Given the requirements above, no power management system will be needed for capacity reasons until 20% of the parking spaces have installed EVSE.

- i. It is recommended that this extra capacity should be in the form of a dedicated panel for EV charging. In the event that this additional capacity is simply left on the larger building panel or transformer, room shall be left in the electric or utilities room for the future EV-specific electrical panels. This includes a minimum of 3 linear feet of wall space for the control panel with 3' clear floor space in front.
  - ii. In either case, the capacity left for future charging must be reserved specifically for that charging. Thus, the designer should consider future capacity needs for other building systems (if any) and plan additional capacity accordingly.
- b. To ensure ease of future planning and installation, electrical and design plans shall indicate that the service capacity of the electrical system, including any on-site distribution transformer(s), meet the requirements detailed above. The plans must demonstrate that capacity is sufficient to operate at the EVSE at full rated amperage or a minimum of 40 amps per branch circuit, whichever is greater. As appropriate, construction documents shall provide information on amperage of future EVSE, raceway method(s), wiring schematics, anticipated EV load management system design(s), and electrical load calculations.

### **Section E - DC Fast Charging**

1. When desired, a DC Fast Charger can be installed and reduce the total number of EV charging spots by 10, provided that there is still a minimum of one Level 2 charger available.
  - a. Electrical panels serving the DC fast charger must have capacity to provide a minimum of 63-amps at 480 volts AC and 2-amps at 120 volts AC, as well as a 40-Amp 208 or 240-volt branch circuit for each Level 2 charger in that area.
  - b. Consult Logistics Services for additional details on if, how, and where these charging stations should be deployed.

### **Section F – ADA Compliance**

1. EVSE must be ADA compliant. The 2017 California Building Code provides guidance on the specific requirements and it is generally easier to achieve in new developments compared to retrofitting of old buildings.
2. There are ADA exemptions for fleet parking. GSA-Logistics should be consulted and can assist with ADA requirements as they relate specifically to EVSE for fleets.

## Appendix A

### Requirements of California Green Building Standards<sup>2</sup>

The minimum requirements of Title 24 are outlined below.

1. The following table provides a framework for calculating how many EV parking spots are required at a given location.

**TABLE 5.106.5.3.3**

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CHARGING SPACES
0-9	0
10-25	1
26-50	2
51-75	4
76-100	5
101-150	7
151-200	10
201 and over	6 percent of total <sup>1</sup>

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

Source: Title 24 Part 11 Section 5.106.5.3.3

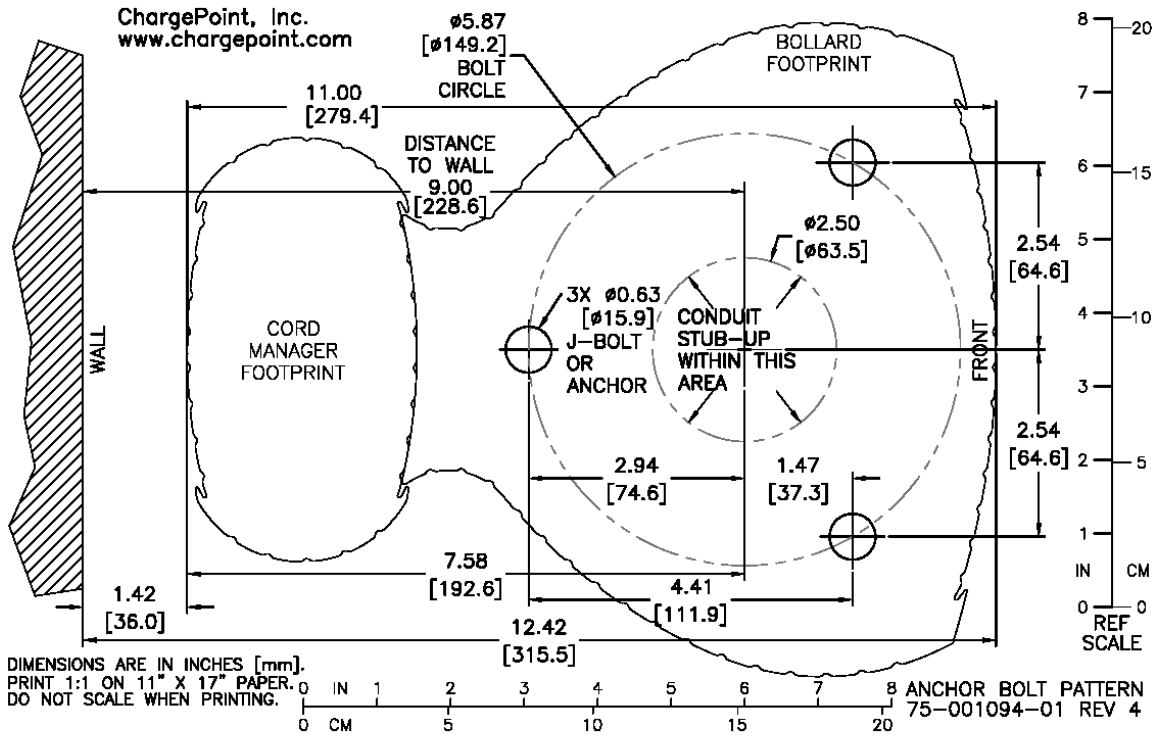
After the EV charging spaces are calculated, the constructions plans and specifications must include;

2. The location of the spots and type of EVSE
3. Raceway(s) that originate at an electrical panel or subpanel and terminate near the proposed EVSE location, and into the appropriate pull-box or enclosure.
4. An electrical plan based on 40-ampere minimum branch circuits.
5. Electrical calculations that ensure that the electrical system, equipment rating, distribution transformers have sufficient capacity to serve all planned future charging stations operating at the same instance and charging EVs are their full rated amperage.
6. Assurance that the service panel or subpanel in the area can accommodate the number of individual branch circuits required to serve the future planned EVSE.

---

<sup>2</sup> This list is paraphrased from Title 24 and is intended as a reference for the rest of the guidelines. It should not be used as a stand in for the language in the regulations.

## Appendix B



### References:

- California Building Code Title 24 Section 11  
<https://codes.iccsafe.org/public/document/details/toc/657>
- San Francisco Green Building Code and Environment Code - Requirements for Installation of Electric Vehicle Chargers