

ARCHITECTURAL / ENGINEERING BULLETIN**Date: March 20, 2023****Bulletin No. 2022-007R1****Bulletin Title: Electric Vehicle Charging Stations (EVCS)****Bulletin Contact: Carey Demas (323) 980-2610 | carey.demas@build-laccd.org****Background**

The Design Professional of Record (Architect/Engineer) will review all requirements for Electric Vehicle Charging Stations (EVCS) at all Los Angeles Community College District (LACCD) campuses and satellite locations, as well as process engaging stakeholders in requirements to enhance the appeal of driving clean air vehicles in an effort to reduce greenhouse gas emissions. This ensures that newly constructed projects or additions and alterations provide designated parking for clean air vehicles; and LACCDs mandate to provide EVCS with a minimum 25% requirement of all parking lot stalls by 2030.

Definitions

- **Electric Vehicle (EV):** An automotive type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles.
- **Electric Vehicle Charger:** Off-board charging equipment used to charge an electric vehicle.
- **Electric Vehicle Charging Space:** One or more electric vehicle charging spaces served by electric vehicle charger(s) or other charging equipment allowing charging of electric vehicles. Electric vehicle charging stations are not considered parking spaces.
- **Electric Vehicle Charging Station (EVCS):** One or more electric vehicle charging spaces served by electric vehicle charger(s) or other charging equipment allowing charging of electric vehicles. Electric vehicle charging stations are not considered parking spaces. Where multipoint electric vehicle charger can simultaneously charge more than one vehicle, the number of electric charging stations shall be considered equivalent to the number of electric vehicles that can be simultaneously charged.
- **Electric Vehicle Supply Equipment (EVSE):** The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.
- **Electric Vehicle Connector:** A device that when electrically coupled to an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.

Site Considerations

Coordinate any easements with Southern California Edison (SCE) and/or Los Angeles Department of Water and Power (LADWP) that may be required; and EVSE shall be installed in accordance with manufacturer's guidelines and shall be suitable for the environment.

Provide site work or topography plans with point elevations sufficient to show the proposed finished surface slopes and cross-slopes of all EV spaces, access aisles, and accessible routes. Changes in level, drainage grates, slopes exceeding 1:48, and detectable warnings shall not be permitted at accessible EV spaces or their access aisles.

Review the site for best location(s); and plan ahead for future EVCS. Accessible EVCS are required to be on accessible route to the facility entrance (CBC Section 11B-812.5.1), and an accessible route from the vehicle space to the EVSE must be provided (CBC Section 11B-812.5.2). Note accessibility provisions only apply when EV spaces are served by a charging equipment, therefore EV capable and or EV ready spaces intended to be converted into future accessible EVCS must also be on accessible route and meet ground surface requirements.

Number and Type

Where EV spaces are provided in different facilities the number and type of spaces shall be calculated per regulations requiring them separately for each facility. When EVCS are provided in any public or common staff facility, accessible EVCS are also required to be provided. The number of accessible EVCS shall be calculated for each different facility and for each different level of service provided in the facility separately. Each combination of charging level (such as; AC Level 1, AC Level 2, DC Fast Charge) and EV connector type shall be considered as a different facility type (CBC 11B-228.3.2), (different service type under ADA Program Access). A single multiport EV charger that can simultaneously charge two vehicles can be used to serve two EV spaces required to be accessible.

Drawings and Documentation

Provide fully dimensioned and fully noted striping plans and details to accurately show and dimension all EV spaces including the accessible EV spaces, access aisles, pavement markings, accessible route serving them, vertical clearances, EVSE locations, EVSE specifications including notations and photographs to convey compliance with accessibility requirements of ADA and California Building Code (CBC), signage locations and details, notations to convey surface slopes, electrical information, etc.

Surface Markings

Access aisles shall be marked with painted borderlines around their perimeter and diagonal hatch marks at 36 inches on center within the painted border. Striping shall be green in color. Access aisles for accessible EVCS must look different from access aisles required at accessible parking; color blue shall not be used except when one parking space and one electric vehicle charging space share an access aisle.

EVCS vehicle spaces shall provide surface marking stating "EV CHARGING ONLY". The centerline of the text shall be a maximum of 6 inches from the centerline of the vehicle space and its lower corner at, or lower side aligned with the end of the parking space length. The words "NO PARKING" shall be painted on the surface within each access aisle. All lettering shall be 12 inches high minimum color contrasting with pavement.

Signage

When identification signs are required to be provided, detail and provide reflectorized identification signage for EVCS per college sign standards and in compliance with CBC. An International Symbol of Accessibility (ISA) shall be provided at signs identifying all van accessible and standard accessible EV spaces. Identification signs shall be visible from the EV space they serve.

Identification signs shall be permanently posted either immediately adjacent to the vehicle space or within the projected vehicle space width at the front end of the vehicle space. Signs identifying van accessible EV spaces shall contain the designation "Van Accessible."

Security

Identify any necessary measures to prevent vandalism – and theft of EVSE; and ensure that the communications and information technologies of the EVSE comply with LACCD cyber security policies.

Provide site lighting for use of EVCS – and general safety; and visibility of proposed EVCS on site.

Electrical Compliance (2022 California Electrical Code)

EVCS are typically classified by three "levels" of power delivery: Level 1, Level 2 and direct current (DC) fast charging. The primary distinction between these levels is the input voltage – Level 1 uses 110/120 volts, Level 2 uses 208/240 volts, and DC fast chargers (DCFC) use between 208 and 480 volts, and usually require three-phase power inputs. Various manufacturers produce each level of EVCS, with a variety of products with varying prices, applications and functionality.

- Coordinate with SCE and LADWP to ensure electrical infrastructure upside of the meter is sufficient to incorporate the full build-out of the EVCS.
- Provide complete electrical single line drawings showing the main service, sub-panels, and proposed EVCS.
- Include size of overcurrent protection devices for main service, sub panels, disconnects and EVCS circuit supply.

- The overcurrent protection for feeders and branch circuits supplying equipment shall have a rating not less than 125% of the maximum load of the equipment. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.
- If trenching is required, call out trench work in scope of work; and provide trenching details.
- Provide EVCS manufacturer's specification sheets showing Nationally Recognized Testing Laboratory (NRTL) approved listing mark for indoor or outdoor (UL 2202/UL 2200).

Design Compliance with ADA / 2022 California Building Code / 2022 CALGreen

Under the Americans with Disabilities Act (ADA), a Federal Law, not to be confused with the State of California Building Code (CBC), nor with the Department of the State Architect (DSA), all programs services and activities provided by or on behalf of a public entity must be accessible to and usable by individuals with disabilities. Accessible EVCS must therefore be provided for each level of service such as AC Level 1, AC Level 2, DC Fast Charge, etc. and each different type of connector, for each different facility. The accessibility requirements in the CBC are intended to provide full compliance with the requirements of the ADA. All projects at LACCD must fully comply with requirements of both ADA and CBC. It is important to take these requirements into account when planning to install chargers because they impact the spatial needs, and potentially the cost of installations. When there is only one EVCS in the facility it must be Van Accessible, requiring a significantly wider space and more space for adjacent access aisle than a standard parking space

Electrical Vehicle Charging Stations (EVCS) are charging stations. They are not parking spaces and should not be counted as parking stalls (2022 CALGreen Chapter 2, Section 202 Definitions). When EVCS are installed in existing parking structures and parking lots, the use of the vehicle space(s) converted to EVCS will change from parking to charging.

When EVCS are provided in a facility or facilities the CBC requires three (3) different types of accessible EVCS: 1) Ambulatory EVCS; 2) Standard EVCS; and 3) Van Accessible EVCS. Each has different size and layout requirements. Quantity for each type depends on the total quantity of EVCS and types of service and types of connectors provided in each facility. When there is only one EVCS in a facility it must be Van Accessible. More information can be found in the following DSA web site: <https://www.dgs.ca.gov/DSA/Resources/Page-Content/Resources-List-Folder/Access-Compliance-Reference-Materials>

Required Number of EV Spaces and EVCS

In newly constructed buildings and facilities – the minimum number of EV Spaces are regulated by CALGreen as follows:

TABLE A5.106.5.3.1

TOTAL NUMBER OF ACTUAL PARKING SPACES	TIER 1 NUMBER OF REQUIRED EV CAPABLE SPACES	TIER 1 NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) ²
0-9	2	0
10-25	5	2
26-50	11	4
51-75	19	5
76-100	26	9
101-150	38	13
151-200	53	18
201 and over	30 percent of total parking spaces ¹	33 percent of EV capable spaces ¹

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count toward the total number of required EV capable spaces shown in column 2.

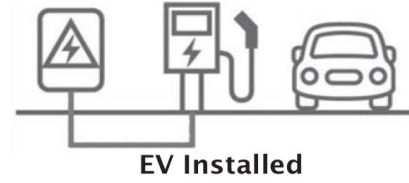
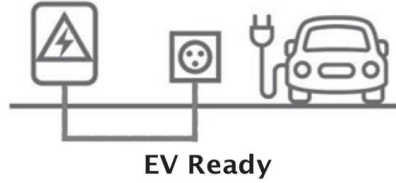
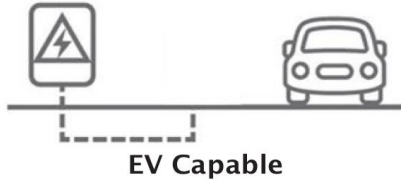
NonResidential Tier 1 Charging Requirements

TABLE A5.106.5.3.2

TOTAL NUMBER OF ACTUAL PARKING SPACES	TIER 2 NUMBER OF REQUIRED EV CAPABLE SPACES	TIER 2 NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) ²
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 parking spaces ¹	33 percent of EV capable spaces ¹

1. Calculation for spaces shall be rounded up to the nearest whole number.
2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count toward the total number of required EV capable spaces shown in column 2.

NonResidential Tier 2 Charging Requirements



Installation of “raceway” (the enclosed conduit that forms the physical pathway for electrical wiring to protect it from damage) and adequate panel capacity to accommodate future installation of dedicated circuits/EVSE.

EV Capable plus installation of dedicated branch circuit(s), circuit breakers, and other electrical components, including a receptacle (240-volt outlet) or blank cover needed to support future installation of one or more charging stations.

EV Ready plus installation of a minimum number of Level 2 electric vehicle supply equipment (EV chargers).

Once the total number of EV spaces are established the number of accessible EVCS can be calculated using CBC Table for each facility or service type.

TABLE 11B-228.3.2.1 ELECTRIC VEHICLE CHARGING STATIONS FOR PUBLIC USE AND COMMON USE

TOTAL NUMBER OF EVCS AT A FACILITY ¹	MINIMUM NUMBER (by type) OF EVCS REQUIRED TO COMPLY WITH SECTION 11B-812 ¹		
	Van Accessible	Standard Accessible	Ambulatory
1 to 4	1	0	0
5 to 25	1	1	0
26 to 50	1	1	1
51 to 75	1	2	2
76 to 100	1	3	3
101 and over	1, plus 1 for each 300, or fraction thereof, over 100	3, plus 1 for each 60, or fraction thereof, over 100	3, plus 1 for each 50, or fraction thereof, over 100

1. Where an EV charger can simultaneously charge more than one vehicle, the number of EVCS provided shall be considered equivalent to the number of electric vehicles that can be simultaneously charged.

TOTAL NUMBER OF ACTUAL PARKING SPACES	NUMBER OF REQUIRED EV CAPABLE SPACES	NUMBER OF EVCS (EV CAPABLE SPACES PROVIDED WITH EVSE) ²
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 ¹	25 percent of EV capable spaces ¹

1. Calculation for spaces shall be rounded up to the nearest whole number.
 2. The number of required EVCS (EV capable spaces provided with EVSE) in column 3 count toward the total number of required EV capable spaces shown in column 2.