

**PLANNING & DEVELOPMENT SERVICES – BUILDING INSPECTION****INSPECTION GUIDELINES:
ELECTRIC VEHICLE CHARGING SYSTEM (EVCS)
COMMERCIAL & MULTI-FAMILY****INSPECTION CODE: 720****SCOPE: COMMERCIAL****APPLICABLE CODES: 2019 CBC, CRC, CPC, CMC, CEC, CALGreen, CEnC, and PAMC**

The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate. The term 'contractor' refers to any owner or company directing the work. 'EVCS' is also indicated as Electric Vehicle Charging Station.

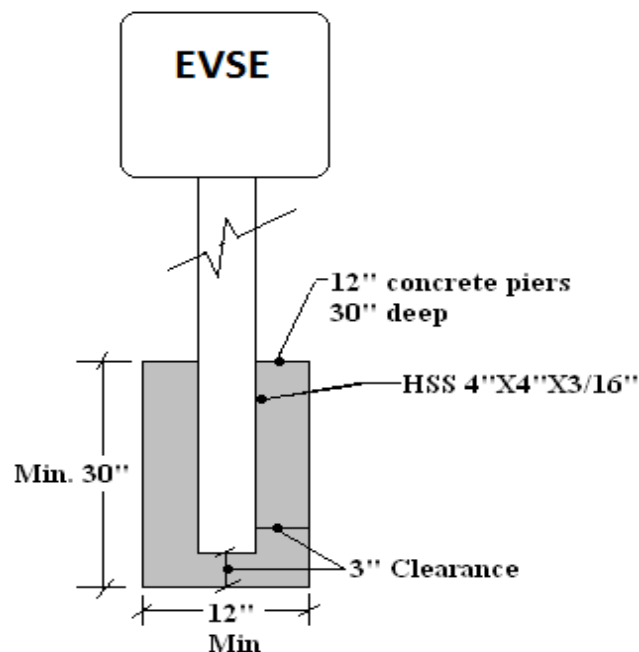
IMPORTANT

- EVCS applications are a separate submittal/permit.
- Fire Department inspection is required prior to the Building Department final.
- HIGHLY RECOMMENDED: Pre-site inspection (300 Accessibility Roughs or Consult)
- Prior to the removing any door, cover or dead front of electrical equipment it shall be de-energized for inspection. (Cal/OSHA Article 3, Section 2320.2) Notify tenant/owner prior to de-energizing.

INSPECTION

- A representative from the installing contractor must be onsite. The representative must understand the project and be able to perform all requirements of this checklist. A pre-construction site visit might be considered (300 Accessibility/Consult).
- Verify work against the manufacturer's installation instructions.
- Check the job-specific site plan for all EVSEs, bollards, electric service, and conduit location. In addition, verify height and dimensions of the EVSE and sidewalk clearances when installed in the sidewalk. If the installation does not match the approved set of plans, or is non-compliant, a revision is required.
- Verify that the disconnect switch is within view of the EVSE and no less than 10 feet from each charging station location and readily accessible by the Fire Department. Disconnect switch door shall be secured. (CPA Municipal Code) Additional signage might be required to show location.

- Check signage. (CPA Municipal Code)
 - Minimum 8"x10" reflective signs with red background and white lettering stating "Electric Vehicle Charging Station EPO" and text should be 1.5" tall, Helvetica Med Compact
 - Labels to be mounted on disconnect switch and state the number charging stations served by the disconnect
- Verify that vehicle collision protection of EVSE is installed. (CPA Municipal Code)
- For equipment over 400 lbs., verify attachment details from a licensed engineer on the approved drawings.
- Provide the following minimum working clearances: 36" in front, 30" in width, and 6'-6" in height. (CEC 110.26)
- Circuit breakers shall be listed to be compatible with the service equipment and panelboards. (This is usually the same manufacturer). (CEC 110.3(B))
- Switchboards, switchgear and panelboards shall be labeled where they are fed from. Labels shall be permanent, durable for the environment and not handwritten (CEC 408.4)
- Verify that the load calculations are included. (CPA Municipal Code)
- See Figure CPA 004 minimum specifications when EVCS or EVSE is mounted on a metal post.



○ **Figure CPA 004 – EVCS or EVSE Mounted on Metal Post – Minimum Specifications**

- Verify the following:
 - Installation meets the approved drawings. (CPA Municipal Code)
 - Conductor size and insulation type
 - Conduit size, type, and location
 - Size of the overcurrent device (i.e. circuit breaker or fuse)
 - The manufacturer and model of the Electric Vehicle Supply Equipment
 - The size of the main electric panel, panelboards and disconnects

DISCONNECTING MEANS

- A disconnecting means shall be provided for equipment rated more than 60amps or more than 150 volts to ground. The disconnecting means shall be lockable open in accordance with 110.25. (CEC 625.43)
- The equipment grounding lug shall be as specified by the manufacturer. Verify that the lug matches the part number as specified on the inside of the door. Verify that the grounding lugs are located where specified by manufacturer. (CEC 110.3 (B))
- Remove any insulating finish, such as paint, under the equipment grounding lug prior to installation. (CEC 250.12)
- Disconnects shall be installed so that the center of the operating handle, at its highest position, is not more than 6 ft 7 in. above the floor or working platform and shall be in a readily accessible location. (CEC 404.8(A)(1))

GROUNDING AND BONDING

- Verify that the electrical service has minimum grounding installed. If it cannot be found or verified, we will ask for grounding to be installed, to include use of metallic water service and two ground rods, placed 6 feet apart. Earth-to-ground testing at 25 ohms or less might be accepted as an alternative.

TORQUE REQUIREMENTS

- Contractor to provide a written list of torque specifications on site for the inspection specific to each piece of electrical equipment, including circuit breakers, equipment grounds, neutrals, and feeders.
- Contractor to torque all connections per the manufacturer's listings prior to the CPA inspection. The inspector will witness a spot check. If all terminations are found to be torqued, no further torquing will be required. If loose connections are found, all connections will be required to be torqued in front of the CPA inspector.
- Verify calibrated torque tool(s). Verify calibration sticker on the torque tool or a receipt of purchase. Receipts are valid for one year. (CEC 110.14(D))
- The contractor shall be on site with the following tools. (CEC 110.3(b), CEC 110.14(D))
 - Torque wrench.
 - Torque screwdriver with a range of up to 50 in-lbs.
 - Slip-joint pliers to secure lugs in place when applying the proper torque.

GAS CLEARANCES

- There shall be no electrical equipment, conduit, or conductors 10 feet above the gas meter or within 18 inches of the service riser (see WGW Standard GD-02A/GD-02B here: <https://www.cityofpaloalto.org/civicax/filebank/documents/34287>).

GREEN BUILDING REQUIREMENTS

- Verify EVCS charging spaces in accordance with the plans and the scope of work for Green Building requirements. (CPA Municipal Code)

ACCESSIBLE PARKING SPACE REQUIREMENTS

Note: The full text for EVCS accessibility requirements can be found in CBC 11B-228.3, 11B-812, 11B-202.2, Exception 10

SCOPING PROVISIONS FOR NEW CONSTRUCTION OR ALTERATIONS

Note: Electric Vehicle Charging Stations (EVCS)

- Where new EVCS are added to a site with existing EVCS, total of new and existing EVCS used for scoping, see below Table 11B-228.3.2.1.
- Technical provisions apply only to new EVCS; Building code does not require retrofit of existing EVCS unless they are altered or upgraded. (CBC 11B-228.3.1.1)
- Alterations, solely for the purpose of installing EVCS at facilities where vehicle fueling, recharging, parking or storage is a **primary function**, shall comply with 11B-202.4 accessible path of travel to the maximum extent feasible without exceeding 20 percent of the cost of the work directly associated with the installation of EVCS. (CBC 11B-202.2, Exception 10)
Note: Primary function types of facilities include gas stations, stand-alone parking lots and standalone parking structures that do not serve a specific building.

- Alterations, solely for the purpose of installing EVCS at facilities where vehicle fueling, recharging, parking or storage is **NOT a primary function**, shall not be required to comply with 11B-202.4 for accessible path of travel. (CBC 11B-202.2 Exception 10)
Note: Facilities that are NOT a primary function include shopping centers, individual stores and office buildings that serve a specific building. While parking is frequently provided at these types of facilities, parking is not the primary function – shopping or conducting business is the primary function at these facilities. (CBC 11B-202.2 Exception 10)

ACCESSIBLE ROUTE

- Verify accessible route is shown on the site plan, including required upgrades of access route elements in accordance with (CBC 11B-402)
Note: Installations of EVCS in existing facilities may be affected by technical infeasibility, when applicable verify completed “Technically Infeasible” form is scanned onto plans. Unreasonable hardship does not apply to path of travel improvements triggered by EVCS installations in existing facilities, because path of travel improvements, when applicable, are already limited to 20 percent of the adjusted construction cost.

- Accessible route to building or facility.** EVCS complying with CBC 11B-812, that serve a particular building or facility, shall be located on an accessible route to an entrance complying with 11B-206.4. Where EVCS do not serve a particular building or facility, EVCS complying with 11B-812 shall be located on an accessible route to an accessible pedestrian entrance of the EV charging facility. (CBC 11B-812.5.1)
Exception: EVCS complying with CBC 11B-812 shall be permitted to be located in different EV charging facilities if substantially equivalent or greater accessibility is provided in terms of distance from an accessible entrance or entrances, charging fee, and user convenience.

- Accessible route to EVSE.** An accessible route complying with CBC 11B-402 shall connect the vehicle space and the EVSE which serves it. (CBC 11B-812.5.2)

- Relationship to accessible routes.** Vehicle spaces and access aisles shall be designed so that when the vehicle space is occupied the required clear width of adjacent accessible routes is not obstructed. A curb, wheel stop, bollards, or other barrier shall be provided if required to prevent encroachment of vehicles over the required clear width of adjacent accessible routes. (CBC 11B-812.5.3)

- Arrangement.** Vehicle spaces and access aisles shall be designed so that persons using them are not required to travel on the traffic side of vehicle spaces or parking spaces other than the vehicle space in which their vehicle has been left to charge.(CBC 11B-812.5.4)
Exceptions:
 1. Ambulatory EVCS
 2. Vehicle spaces installed in existing facilities shall comply with (CBC 11B-812.5.4) to the maximum extent feasible.

- Obstructions.** EVCS shall be designed so accessible routes are not obstructed by cables or other elements. (CBC11B-812.5.5)

ELECTRICAL CHARGING STATIONS

- Verify the number of accessible EVCS spaces is in accordance with Table 11B-228.3.2.1.

Table 11B-228.3.2.1

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

Notes: 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.

* Accessible EVCS designed for accessibility but not reserved for exclusive use by the disabled

LOCATION

- EV chargers shall be adjacent to, and within the projected width of the vehicle space being served. (CBC 11B-812.10.4)

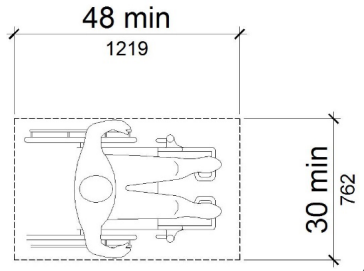
Exceptions:

- EV chargers serving more than one EVCS shall be adjacent to, and within the combined projected width of the vehicle spaces being served.
- For alterations at existing facilities where an accessible route or general circulation path is not provided adjacent to the head end of the vehicle space or access aisle, the EV charger may be located within the projected width of the access aisle 36 inches (914 mm) maximum from the head end of the space.
- Where the long dimension of a vehicle space is parallel to the vehicular way, the EV charger shall be adjacent to, and 48 inches (1219 mm) maximum from the head end or foot end of the vehicle space or access aisle being served.

EV CHARGER REQUIREMENTS

OPERABLE PARTS

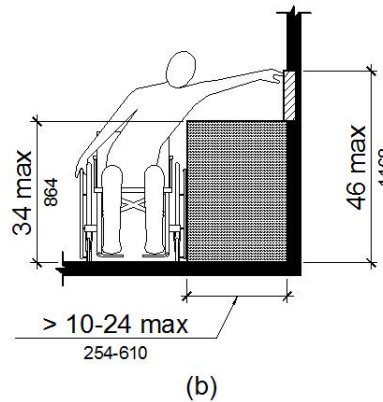
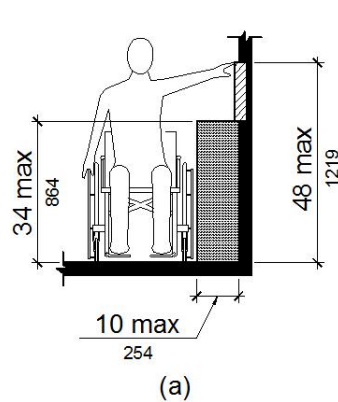
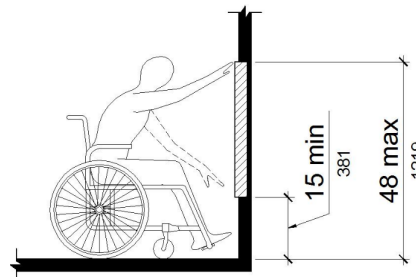
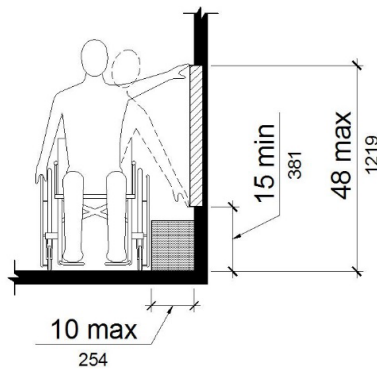
- Provide a clear and level (max. 2.083% slope) floor or ground space, a minimum 30 inches by 48 inches shall be positioned for either forward or parallel approach to the EV charger. See figure below (CBC 11B-309.2, 11B-305, 11B-812.3)



- Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

NOTE: EV connectors are not required to meet 5-pound activating force requirements (CBC 11B-309.4)

- Height and reach range requirements for operable parts (see figures below). (CBC 11B-308.2)



ACCESS AISLE REQUIREMENTS

- The access aisle shall extend to full length of EV space minimum 18 feet. (CBC 11B-812.7)
- An access aisle can be shared by two accessible EV spaces. (CBC 11B-812.7)
- Provide a painted borderline around the perimeter of the access aisle, hatch lines 36 inches on center maximum within, and “NO PARKING” in 12 inches high letters visible from the adjacent vehicular way. (CBC 11B-812.7.3)
- Markings must contrast to vehicle surface, and the blue color required for identification of access aisles in accessible parking shall not be used. (CBC 11B-812.7.2)

GROUND SURFACE SLOPES

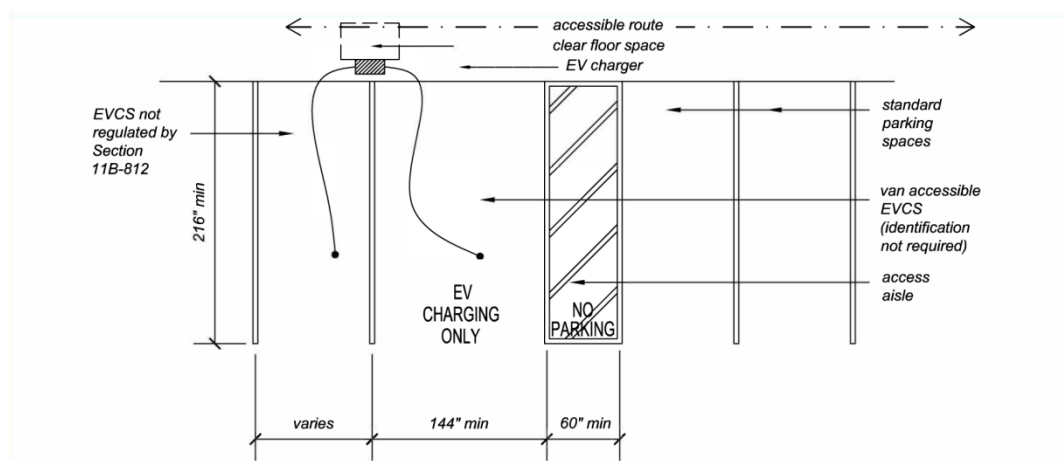
- Verify existing/new parking spaces and access aisles that serve new EVCS do not exceed 1:48 (2.083%) slope in any direction. (CBC 11B-812.3)
- Detectable warning (truncated domes) shall not be permitted in vehicle spaces and access aisles. (CBC 11B-812.3)

EVCS SPACE DIMENSIONS

- Verify dimensions of EV accessible parking spaces, access aisles, required markings, and lettering. (CBC 11B- 812.6, CBC 11B-812.7)
 - See illustrated dimensions below for van, standard and ambulatory EV spaces

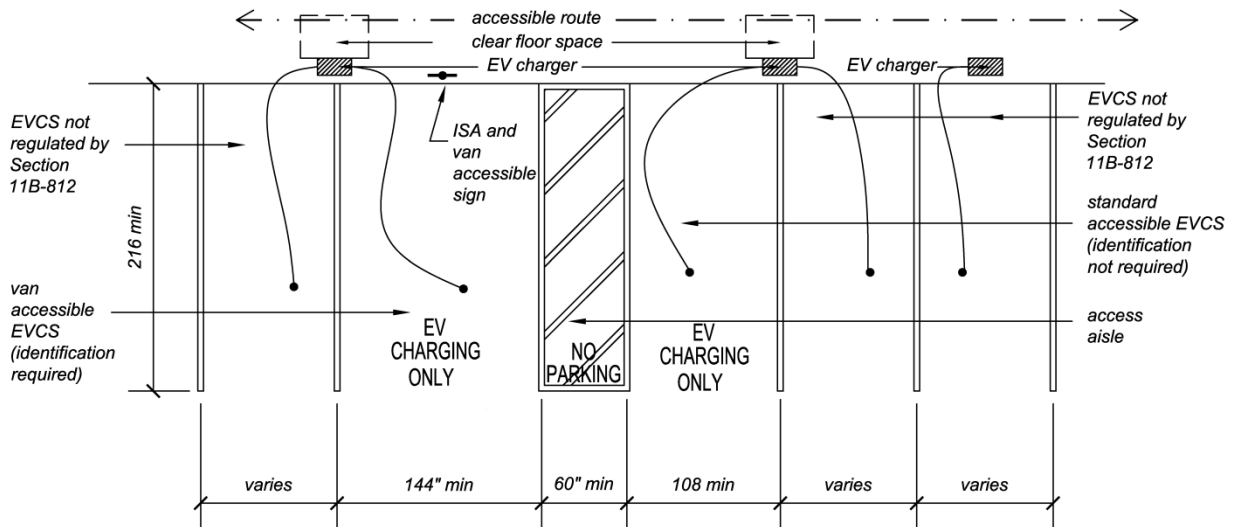
SAMPLE CONFIGURATION WITH TWO EVCS: ONE VAN ACCESSIBLE EV SPACES REQUIRED

Minimum One Van EVCS (CBC 11B-812.8.1)



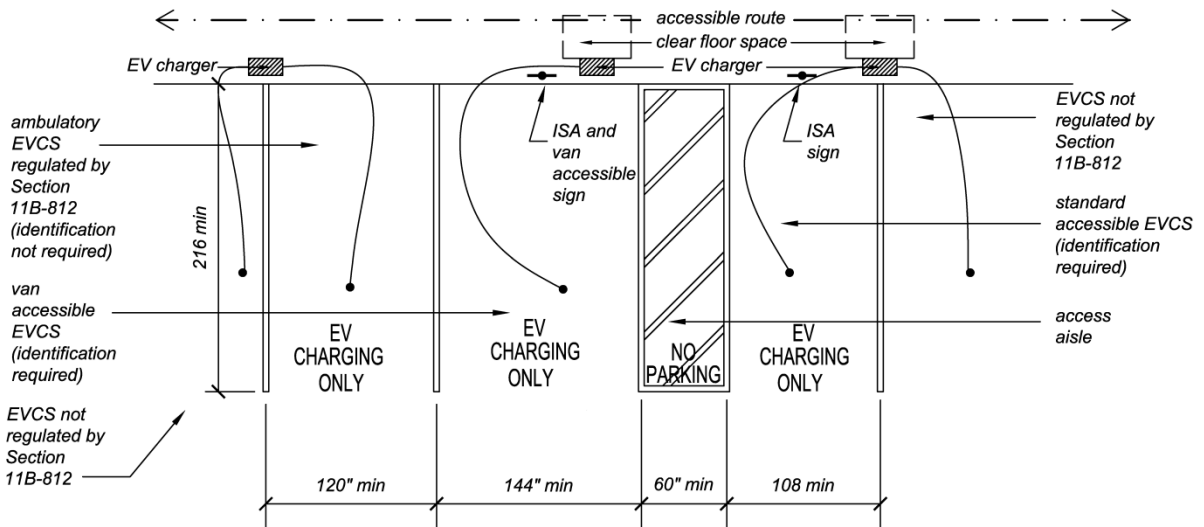
SAMPLE CONFIGURATION WITH FIVE EVCS: TWO ACCESSIBLE EV SPACES REQUIRED

One Van and One Standard Accessible EVCS (CBC 11B-812.8.2)



SAMPLE CONFIGURATION WITH 26 EVCS: THREE ACCESSIBLE EV SPACES REQUIRED

One Ambulatory, One Van and One Standard Accessible EVCS 11B-812.8.3



VERTICAL CLEARANCE

- Vehicle spaces, access aisles serving them, and vehicular routes serving them shall provide a vertical clearance of 98 inches minimum. Where provided, overhead cable management systems shall not obstruct required vertical clearance. (CBC 11B-812.4)

IDENTIFICATION FOR ACCESSIBILITY

Note: International Symbol of Accessibility (ISA)

**INSTALLATIONS OF 1-4 EVCS**

- No identification signs are required. (CBC 11B-812.8.1)
- While an accessible EV space is designed for accessibility, its use is available to everyone and not limited to those with access license plates or placards. (CBC 11B-812.8.1)

INSTALLATIONS OF 5-25 EVCS

- One van-accessible EV space shall be identified with an ISA; the standard accessible EV space shall not be required to be identified with an ISA. (CBC 11B-812.8.2)

INSTALLATIONS OF 26 OR MORE EVCS

- All required van-accessible and all required standard-accessible spaces shall be identified by an ISA. (CBC 11B-812.8.3)

AMBULATORY EVCS

- Not required to be identified with an ISA. (CBC 11B-812.8.4)

DRIVE-UP EVCS

- Not required to be identified with an ISA. (CBC 11B-812.8.5)

SIGNS

- The ISA sign shall be reflectorized with a minimum area of 70 square inches. (CBC 11B-812.8.7)
- Location of sign adjacent to EV space or at head end of EV space, mounted 60" above finish floor (AFF) to bottom of sign, may be mounted on wall, or mounted 80" AFF if in accessible route. (CBC 11B-812.8.7)
- Where signs are required, and if EV space is van accessible, then a sign stating "VAN ACCESSIBLE" shall be provided. (CBC 11B-812.8.7)