

INSTALLATION CHECKLIST MULTI-UNIT DWELLING ELECTRIC VEHICLE CHARGING STATION (EVCS)

Installations must be completed by a licensed electrical contractor (C-10). (Local Regulations, California Electrical Code CEC Article 625) Plans must show conformance with the California Electrical Code Title 24, Part 3, the California Building Code (Volume 1 and 2), Title 24, Part 2, and other applicable local municipal codes.

Submittal Documents required*

Permit Application

- i. Include job address (a unique address for the EVCS installation that is used for billing), parcel number, existing use, description of work, name, address, and contact information of the applicant and the owner.

Plan Sets (Number, size of plans)

a. Site/Plot Plan

- i. Show full property extent (property lines, parking areas, structures, etc.).
- ii. List relevant property information, such as existing parking counts and ratios.
- iii. Provide a detailed site plan showing where the charging unit is located within the parking garage or lot, and any necessary accessibility improvements
- iv. As required by type of EVCS, installation mounting method, and local jurisdiction requirements provide necessary structural details.

b. Electrical Plan

- i. Provide a complete electrical single line drawing showing the main service, sub panels, and proposed EVCS.
- ii. Include size of overcurrent protection devices (in amperes) for main service, sub panels, disconnects and EVCS circuit supply.
- iii. Show conduit sizes and types, and conductor sizes and types.
- iv. Provide a trenching detail and call out trench work in the scope of work on the plan if trenching is required. Trenching may result in a structural plan review if conduit trenches undermine foundations.
- v. Note electrical feeder requirements when trenching structure to structure (CEC 225). The feeder from structure to structure should be noted in the scope of work. Verify that trenching complies with minimum cover requirements for wiring methods or circuits (18" for direct burial per CEC 300).

- vi. Provide EVCS manufacturer's specification sheets showing Nationally Recognized Testing Laboratory (NRTL) approved listing mark for indoor or outdoor (UL 2202/UL 2200).

Electrical Load Calculation Worksheet

- i. Include existing and proposed load to estimate if existing electrical service will handle the new load from EVCS and wiring methods. Note: Unless electrical service equipment is 100% rated, the calculated load demand on the main service shall not exceed 80% of the nameplate rating of the main service over-current protection device (OCPD). (CEC 625.40)

***All plans and documents listed above must be provided for multi-unit dwelling electric vehicle charging stations at time of permit submittal prior to issuance.**

Pre-Installation Work

1. Determine units to be installed. Follow all manufacturer specifications for installation. Must be NRTL listed and suitable for the location, indoor or outdoor.
2. Conduct site assessment and submit quote to customer for approval of work and utility upgrades or new service if applicable. Assess the site for:
 - i. All electrical system elements (main service, sub-panels, disconnecting means, etc.)
 - ii. Current electrical code deficiencies
 - iii. Existing electrical load
 - iv. Wet and dry utility locations (affecting trench paths for electrical)
 - v. Presence of corrosive conditions (e.g. salt air, etc.) affecting recommended equipment
 - vi. Water drainage (to avoid locating EVCS in areas with possible standing water)
 - vii. Site accessible parking, and / or accessibility of proposed EVCS
 1. Site slope at proposed EVCS location
 2. Surface conditions
 3. Access path(s) connectivity to on-site uses
 - viii. Visibility of proposed EVCS from uses on site, and/or from public rights-of-way (safety)
 - ix. Site lighting for use of EVCS and general safety
 - x. Placement of EVCS to serve only one versus multiple parking stalls (dependent on hosts intended use of the EVCS)
 - xi. EVCS protection from vehicle damage through proper placement, and then physical protection (e.g. wheel stops, bollards)
 1. EVCS orientation
 2. Facilitating ease of human interface
 3. Minimizing sun exposure on digital screens
 4. Facilitating ease of cable management
 - xii. Placement and/or screening of electrical support equipment (e.g. transformers, meter pedestals/cabinets, etc.) as it relates to site aesthetics
 - xiii. Need for signage and / or stenciling at the EVCS location(s), and / or as directional signage on large sites

3. Complete permit application from local jurisdiction and electrical load calculation for proposed stations (Include load calculations for EVCS):
 - i. Mandatory requirements for new construction in new multifamily dwellings of 17 or more units to be EV Capable. 3% of the total parking spaces, but not less than one, shall be capable for supporting future EVCS. (CALGreen Code Section 4.106.4.2)
4. Contact local utility provider for service work order for utility upgrades/notification of new service. File appropriate Service and Meter Request Form.
 - i. Ensure utility work order is approved. Any work on the utility side of the electric service requires a work order and disconnect/re-connect.
 - ii. Following utility approval, permit is approved, issued and appropriately posted.
5. Construction plans indicate how requirements for types of wiring and installation siting. Show compliance with requirements of NFPA 70, CEC Article 625.
6. Construction plans show compliance with the California Building Code Title 24, Part 2, Section 11B-812 and Section 11B-228.
 - i. Signage for EVCS (International Symbol of Accessibility (ISA) signage for ADA accessible spots be provided in compliance with Section 11B-812.8).
 - ii. For a facility for public and common use, minimum number of EVCS required to comply with Section 11B-812.

Equipment and Scheduling

7. Schedule all necessary contract work for installation of new service (if applicable), and pulling wires from electric panel(s) / meter pedestals to parking structure(s) or lot(s):
 - i. Boring, trenching, concrete and/or paving restoration if these operations are included in project scope
 - ii. Indoor-rated EVCS can be installed in a garage (CEC 625.50)
 - iii. Outdoor installations require outdoor-rated EVCS (CEC 625.50)
 - iv. Coordinate with property manager, Homeowners Association, property owner(s), and/or tenants for scheduling installation
8. Coordinate with the utility for markings of existing power lines, gas lines or other infrastructure is completed and utilize “call before you dig” services (811), service upgrade, new service/meter pull.

Installation

9. Secure the construction area appropriately (e.g. temporary fencing, barriers and signage) for safe working conditions. Prepare mounting surface prior to installation.
10. Remove material to run conduit and/or wiring (i.e., drywall, insulation, pavers, concrete, pavement, earth, etc.).

11. Install rough electrical conduit, boxes and fittings, subpanels etc. in walls, ceilings, floors and trenches to be covered.
12. Request a rough inspection from the building inspection office prior to covering any rough electrical installations.
13. Install charging unit(s) per manufacturer instructions and permitted construction plans. (CEC 110.3)
 - i. Install circuit conductors of appropriate size to comply with rating of the overcurrent protection. Securely fasten wiring to the structure. (CEC 300.11, CEC 210.19, CEC 215.2(A), CEC 110.3(B); CEC 310.15(B); CEC 625.40)
 - ii. Identify and install properly sized equipment grounding conductor with the branch circuit. Connect at the EVCS and panelboard or service. (CEC 250.110, 112, 114, 119, 120, 122; CEC 300.3(B))
 - iii. Bring grounded conductor to the service disconnect and bond to the enclosure. (CEC 250.24 (C))
 - iv. Install overcurrent protection for any newly installed service equipment and conductors. (CEC 230.90, 91)
 - v. Install disconnect in proper readily accessible location for EVCS that is rated more than 60 amperes or more than 150 Volts to ground. (CEC 625.23) If additional service disconnects are installed, verify that they are grouped and do not exceed the maximum number of service disconnects. (CEC 230.71, 72)
 - vi. Identify branch circuit device and disconnects. (CEC 408.4 (A); CEC 110.22(A))
 - vii. Install properly sized supply-side bonding jumpers. (CEC 250.50, 104(A) and (B))
14. Install wheel blocks/safety bollards as needed, and per approved plans. (CEC 110.27(B))
15. Perform finish work to repair existing surfaces, infrastructure, and landscaping, and parking lot striping (if applicable).
16. Make electrical connection and schedule for inspection with local jurisdiction Building Inspector.