



## Checklist for Multi-Family Residential Electric Vehicle Charging Station Article 625 – 2016 California Electrical code (CEC)

### General Requirements:

#### Level 1 Charger:

- 110V dedicated 20 amp circuit
- No electrical plans required

#### Level 2 Charger:

- 220V dedicated circuit
- Cut sheets for equipment are required
- Load calculations are required
  - If installing an EVSE (electric vehicle supply equipment) that is listed with a cord/plug connection, then only the cut sheets and the load calculations need to be provided.
  - If installing an EVSE that is hardwired with or without a time of use meter then all of the following are required:
    1. Equipment cut sheets.
    2. Load calculations (complete load calculations worksheet).
    3. Site plan (show structures, service, EVSE, and (N) meter if applicable).
    4. Single line diagram (show the service size, EV breaker size, EV conductor size, number of conductors, EVSE, time of use meter (if applicable)).

If the scope of work only includes installing a time of use meter for an existing EVSE then no plans are required. Verify that the original EVSE installation was permitted.

**Specific Requirements:**

Check One	Type of Charging Station(s) Proposed	Power Levels (proposed circuit rating)
<input type="checkbox"/>	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps
<input type="checkbox"/>	Level 2 - 3.3 kilowatt (kW) (low)	208/240 VAC at 20 or 30 Amps
<input type="checkbox"/>	Level 2 – 7.2kW (medium)	208/240 VAC at 40 Amps
<input type="checkbox"/>	Level 2 – 10kW (high)	208/240 VAC at 50 Amps
<input type="checkbox"/>	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps
<input type="checkbox"/>	Other (provide detail)	

**PERMIT APPLICATION REQUIREMENTS**

- 1) Is the permit application complete with the following information: Project address, parcel #, builder/owner name, contractor name, valid contractor license #, phone numbers and any other requirement? Yes  No
- 2) Does the application include electric vehicle charging station model number, manufacturer's specs and installation guidelines? Yes  No

**ELECTRICAL LOAD CALCULATION WORKSHEET**

- 1) Is an electrical load calculation worksheet included? (Article 220 2016 CEC) Yes  No
- 2) Based on the load calculation worksheet, is a new electrical service panel upgrade required? Yes  No 
  - a. If yes to Q2, do plans include the electrical service panel upgrade? Yes  No
  - b. If yes to Q2, has the Healdsburg Electric Department reviewed and approved the installation and confirmed the necessary utility work? Yes  No
- 3) Is the charging circuit appropriately sized for a continuous load? Overcurrent protection for circuits supplying electric vehicle supply equipment shall be sized for continuous duty and shall have a rating of not less than 125% of the maximum load of the EVSE (i.e. if the maximum load of the charger is 40A then a 50A breaker is required). Yes  No
- 4) If charging equipment proposed is a Level 2 – 10kW station with a circuit rating of 50 Amps or higher, is a completed circuit card with electrical calculations included with the single line diagram? Yes  No

### **SITE PLAN & SINGLE LINE DRAWING**

- 1) Is a site plan and electrical plan with a single-line diagram included with the permit application? Yes  No  Not Applicable 
  - a. If mechanical ventilation requirements are triggered for indoor venting requirements (CEC 625.29(D)), is a mechanical plan included with the permit application? Yes  No  Not Applicable
- 2) Is the site plan fully dimensioned and drawn to scale? Yes  No 
  - a. Showing location, size, and use of all structures? Yes  No
  - b. Showing location of electrical panel to charging system? Yes  No
  - c. Showing type of charging system and mounting? Yes  No
  - d. Is the type of mounting for charging system included if the charging system is not wall-mounted? Yes  No  Not Applicable

### **COMPLIANCE WITH 2016 CALIFORNIA ELECTRICAL CODE**

- 1) Does the plan include EVCS manufacturer's specs and installation guidelines? Yes  No
- 2) Does the electrical plan identify the amperage and location of existing electrical service panel?  
Yes  No 
  - a. If yes to Q2, does the existing panel schedule show room for additional breakers?  
Yes  No
  - b. Are sizes for the conduit and conductor included? Yes  No
- 3) Is the charging unit rated more than 60 amps or more than 150V to ground? Yes  No 
  - a. If yes to Q3, are disconnecting means provided in a readily accessible location in line of site and within 50' of EVCS? (CEC 625.23) Yes  No
- 4) Does the charging equipment have a Nationally Recognized Testing Laboratory (NRTL) approved listing mark? (UL 2202/UL 2200) Yes  No
- 5) If trenching is required, is the trenching detail called out? Yes  No 
  - a. Is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes  No
  - b. Is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" min. cover over conduit per CEC 300) Yes  No

### **COMPLIANCE WITH 2016 CALIFORNIA GREEN BUILDING STANDARDS CODE**

- 1) Do CAL Green EV Readiness installation requirements apply to this project? Yes  No 
  - a. Do the plans demonstrate conformance with mandatory measures for 3% of total parking spaces, but no less than one, for new multifamily dwellings with 17+ units that must be EV capable? (4.106.4.2) Yes  No

- b. Do the construction documents indicate the location of the proposed EV spaces where at least one is located in common use areas and available to all residents for use? (4.106.4.2.1)
- 2) When EV chargers are installed, EV spaces required by Section 4.106.4.2.2 item 3 shall comply with at least one of the following options:
- a. The EV space shall be located adjacent to an accessible parking space that complies with California Building Code Chapter 11-A, to allow use of the EV charger from the accessible parking space.
  - b. The EV space shall be located on an accessible route, as defined by California Building Code Chapter 2, to the building.
  - c. EV charging space(s) comply with Section 4.106.4.2.2, items 1, 2 and 3 (below).
    - The minimum length of each EV space shall be 18 feet (5486 mm).
    - The minimum width of each EV space shall be 9 feet (2743 mm).
    - One in every 25 EV spaces, but not less than one, shall also have an 8-foot (2438 mm) wide minimum aisle. A 5-foot (1524 mm) wide minimum aisle shall be permitted provided the minimum width of the EV space is 12 feet (3658 mm).
      - Surface slope for this EV space and the aisle shall not exceed 1 unit vertical in 48 units horizontal (2.083 percent slope) in any direction.

**STATEMENT OF COMPLIANCE**

By my signature, I attest that the information provided is true and accurate.

Job Address: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

In addition to this document, you will also need to provide a copy of the manufacturer’s installation literature and specifications for the Level 2 charger you are installing.

Note: This is a voluntary compliance alternative and you may wish to hire a qualified individual or company to perform a thorough evaluation of your electrical service capacity in lieu of this alternative methodology. Use of this electrical load calculation estimate methodology is at the user’s risk and carries no implied guarantee of accuracy. Users of this methodology and these forms are advised to seek professional assistance in determining the electrical capacity of a service panel.



## Electrical Load Calculation Worksheet

### 2016 C.E.C 220.82 (100 AMP Minimum)

**Permit #** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Contractor/Owner:** \_\_\_\_\_ **Size of service panel\*\*:** \_\_\_\_\_ **AMPS**

**Job Address:** \_\_\_\_\_ **Total SF:** \_\_\_\_\_

**Phone #** \_\_\_\_\_ **Email:** \_\_\_\_\_

ITEM	WATTS	EXAMPLES FOR A/C AND HEATER WATTS*
_____ Sq.Ft. @ 3 watts per Sq.Ft.		1) - A/C with gas heat
20 amp appliance circuits @ 1,500 watts each		- compressor 20 amps
Range (NPR - nameplate rating)    Gas: Yes No		- fan(s)         5 amps
Oven (NPR)                                     Gas: Yes No		TOTAL         25 amps x 240 volts = 6,000 watts
Cooking Units (NPR)                         Gas: Yes No		2) - A/C with 5 kw electric heater
Water Heater (NPR)                            Gas: Yes No		- compressor 20 amps
Dishwasher (NPR)		- fan(s)         5 amps
Disposal (NPR)		TOTAL         25 amps x 240 volts = 6,000 watts
Washer @ 1,500 watts (min)                 Gas: Yes No		- 5,000 watt heater x 65% =         3,250 watts
Dryer @ 5,000 watts (min)		- Use larger of A/C or heater - i.e. - 6,000 watts
Motors (NPR)		3) - A/C with 10 kw electric heater
Electric vehicle supply equipment (NPR)		- compressor 20 amps
Other (NPR)		- fan(s)         5 amps
Other (NPR)		TOTAL         25 amps x 240 volts = 6,000 watts
SUBTOTAL:		- 10,000 watt heater x 65% =         6,500 watts
		- Use larger of A/C or heater - i.e. - 6,500 watts
1st 10,000 watts of SUBTOTAL @ 100%		4) - A/C with heat pump
Remaining _____ watts @40%		- compressor 20 amps
Largest of A/C or electric heater or heat pump*		- fan(s)         5 amps
TOTAL WATTS:		SUBTOTAL     25 amps x 240 volts = 6,000 watts
		- 5,000 watt heat strips @ 65% =     3,250 watts
TOTAL WATTS DIVIDED BY 240 VOLTS =	AMPS**	TOTAL                                     9,250 watts

\* Use largest of 100% of air conditioner or 65% of the heater or when residence has a heat pump, add 65% of auxiliary heat strips to 100% of air conditioner / heat pump

\*\* The calculated load must be less than the existing electrical service otherwise the service will need to be upgraded.