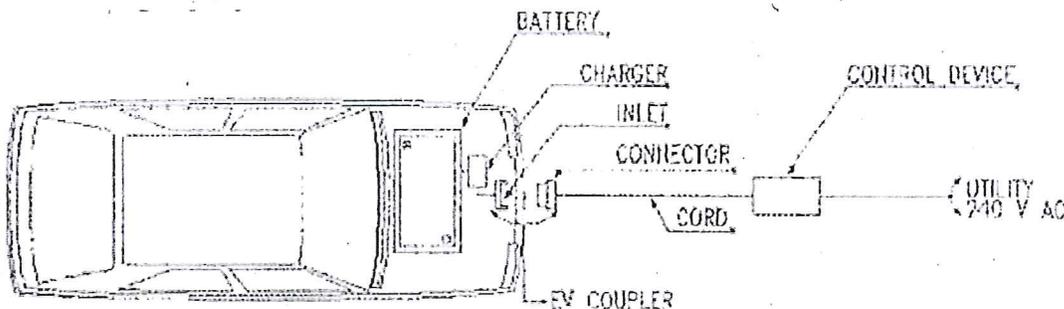




Electric Vehicle (EV) charging system in Single Family Residence (SFR)

A number of automakers are currently mass producing electric vehicles and offering incentives to consumers. Therefore efficient permitting and inspection for EV electric charging system will be required to help encourage the use of EV in California. Ideally with the proper documentation, permits to install Electric Vehicle Supply Equipment (EVSE) could be issued over-the-counter.

EV Charging System:



EVSE

Electric Vehicle Supply Equipment (EVSE) consists of the connector, cord, and interface to utility power. Currently the interface between the EVSE and utility power will be directly hard-wired to the control device, and each automaker has its own EVSE design. Around the end of 2010, a single design called the J1772 Standard EV coupler will be available. J1772 will be applicable for all electric vehicles.

There are 2 levels of charging system for SFR — Level 1 (120 VAC, 15/20 A) and Level 2 (240 VAC, 40A). Level 2 is most likely be used because of less time to charge the vehicle.

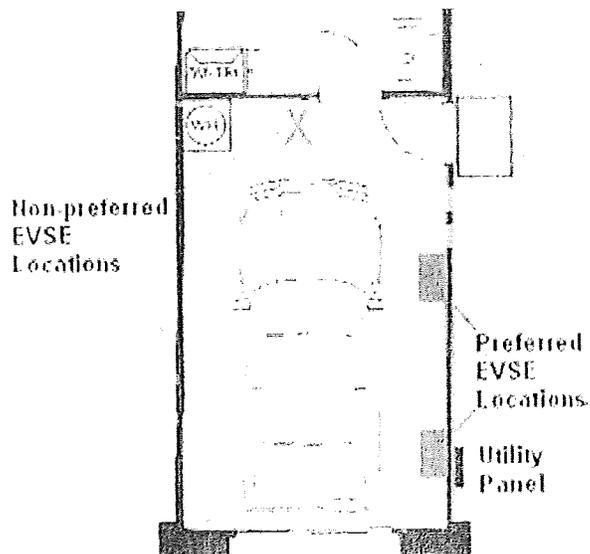
An electrical permit is required for an EV charging system to be installed in the garage or carport of a SFR. The following information is required for a permit:

1. EV charging system information: level 1 or 2, EVSE system with UL listed number or other approved nationally recognized testing laboratory, in compliance with UL2202, "Standard for Electric Vehicle (EV) Charging System Equipment"
2. Existing electrical service panel information at the residence. Include EVSE load and circuit size to determine if electric panel upgrade is required.(see worksheet)
3. Panel upgrade and electrical wiring shall be in conformance with the California Electrical code
4. Identify if a second electric meter is required to be installed because of electric utility rate for EV charging
5. Clarify EVSE location. EVSE shall be installed in accordance with manufacturer's guideline and must be suitable for the environment (indoor/outdoor).
6. Manufactures installation guideline has to available for the inspector at the site.

CODE REFERENCE (S):

2013 California Electrical Code Article 625

Underwriters Laboratory (UL) listed charging system



Level 2 Electric Vehicle Charger Service Load Calculator

INSTRUCTIONS: Review the list of electrical loads in the table below and check all that exist in your home (don't forget to include the proposed Level 2 charger). For each item checked, fill in the corresponding "Watts Used" (refer to the "Typical Usage" column for wattage information). Add up all of the numbers that are written in the "Watts Used" column and write that number in the "TOTAL WATTS USED" box at the bottom of the table. Then go to the next page to determine if your existing electric service will accommodate the new loads.

(Loads shown are rough estimates; actual loads may vary. For a more precise analysis, use the nameplate ratings for appliances and other loads and consult with a trained electrical professional.)

Check all Applicable Loads (✓)	Description of Load	Typical Usage	Watts Used
GENERAL LIGHTING AND RECEPTACLE OUTLET CIRCUITS			
	Multiply the square footage of house x 3	3 watts/sq. ft.	
KITCHEN CIRCUITS			
	Kitchen circuits	3,000 watts	
	Electric oven	2,000 watts	
	Electric stove top	5,000 watts	
	Microwave	1,500 watts	
	Garbage disposal under kitchen sink	1,000 watts	
	Automatic dish washer	3,500 watts	
	Garbage compactor	1,000 watts	
	Instantaneous hot water at sink	1,500 watts	
LAUNDRY CIRCUITS			
	Laundry circuit	1,500 watts	
	Electric clothes dryer	4,500 watts	
HEATING AND AIR CONDITIONING CIRCUITS			
	Central heating and air conditioning	6,000 watts	
	Window mounted air conditioning	1,000 watts	
	Whole-house or attic fan	500 watts	
	Central electric furnace	8,000 watts	
	Evaporative cooler	500 watts	
OTHER ELECTRICAL LOADS			
	Electric water heater (storage type)	4,000 watts	
	Electric tankless water heater	15,000 watts	
	Swimming pool or spa	3,500 watts	
	Other (describe)		
	Other (describe)		
	Other (describe)		
ELECTRIC VEHICLE CHARGER CIRCUIT			
	Level 2 electric vehicle charger wattage rating		
		TOTAL WATTS USED	

INSTRUCTIONS: Using the "TOTAL WATTS USED" number from the previous page, check the appropriate line in column 1 and follow that line across to determine the minimum required size of the electrical service panel shown in column 3. In column 4, write in the size of your existing service panel (main breaker size). If your existing service panel (column 4) is smaller than the minimum required size of the existing service (column 3), then you will need to install a new upgraded electrical service panel to handle the added electrical load from the proposed Level 2 charger.

The table below is based on CEC 220.83(A), 230.42 and Annex D.

1	2	3	4
Check the appropriate line (✓)	Total Watts Used (from previous page)	Minimum Required Size of Existing 240-Volt Electrical Service Panel (Main Service Breaker Size)	Identify the Size of Your Existing Main Service Breaker (Amps)*
	up to 48,000	100 amps	
	48,001 to 63,000	125 amps	
	63,001 to 78,000	150 amps	
	78,001 to 108,000	200 amps	
	108,001 to 123,000	225 amps	

*Note that the size of your existing service (column 4) MUST be equal to or larger than the Minimum Required Size (column 3) or a new larger electrical service panel will need to be installed in order to satisfy the electrical load demand of the EV charger.

STATEMENT OF COMPLIANCE

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

Job Address: _____
(Print job address)

Signature: _____
(Signature of applicant) (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.