

COUNTY OF RIVERSIDE BUILDING AND SAFETY DEPARTMENT

ELIGIBILITY CHECKLIST FOR EXPEDITED ELECTRIC VEHICLE CHARGING STATION PERMIT RESIDENTIAL BUILDINGS (EVSE) For One- & Two- Family Dwellings

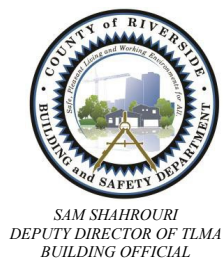
Please complete the following information related to permitting and installation of Electric Vehicle Service Equipment (EVSE) as a supplement to the application for a building permit. This checklist contains the technical aspects of EVSE installations and is intended to help expedite permitting and use for electric vehicle charging equipment.

Upon this checklist being deemed complete, a permit shall be issued to the applicant. However, if it is determined that the installation might have a specific adverse impact on public health or safety, additional verification will be required before a permit can be issued.

EVSE Charging Level:	☐ Level 1 (120V)	☐ Level 2 (240V)
Maximum Rating (Nameplate) of EV Service Equipment = _____ kW		
Voltage EVSE/ EV Outlet = _____ V	Manufacture of EVSE/ EV Outlet:	
EV Outlet Rating = _____ Amps	EV Outlet Breaker Size = _____ Amps	
Mounting of EVSE or EV Outlet: ☐ Wall Mount ☐ Pole Pedestal Mount ☐ Other:		

Complete the Service Load Calculation form provided on page 4 & 5.
If the Existing Load cannot be not known by the above method, then the Calculated Load may be estimated using the “Single-Family Residential Permitting Application Example” in the Governor’s Office of Planning and Research “Zero Emission Vehicles in California: Community Readiness Guidebook” https://www.opr.ca.gov .

System Voltage is limited to 120/240V, 1 Phase
Rating of Existing Main Electrical Service Equipment = _____ Amps
Rating of New Main Electrical Service Equipment (if upgrade is required) = _____ Amps
Rating of Panel Supplying EVSE (if not directly form main service) = _____ Amps
EVSE Rating _____ Amps x 1.25 = _____ Amps = Minimum Breaker
<i>Enter rating (Amps) below and use page 5 for the following information:</i>
Rating of Circuit for EVSE: _____ Amps / _____ Poles
Ampacity of EVSE Conductor = # _____ AWG
Conduit size = _____ Conduit Size = _____
Floor plan showing the location of all electrical equipment shall be submitted, <i>see page 6</i>
Provide Spec sheet and Installation instructions for UL listed EV Charger (if applicable)
Provide Spec sheet for new UL listed EV outlet
• EV Outlets require a label indicating the Max EV Charger Rating Amps (see pg. 2 & 5 for additional info.)
General installation requirements on page 6 to be followed during installation of the EVSE.



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EV OUTLET REQUIREMENTS:

EV Outlets shall be either Extra Heavy Duty or “EV Rated”, designed to sustain the necessary extended charge time and high frequency use of the EV Charger.

Max EV Charger Rating Table:

Note: EV Rating shall be limited to 80% of the breaker rating.

Size of EV Charger Circuit Breaker	Max EV Charger Rating*	Size of EV Charger Circuit Breaker	Max EV Charger Rating*
30 Amps	24 Amps	70 Amps	56 Amps
40 Amps	32 Amps	80 Amps	64 Amps
50 Amps	40 Amps	90 Amps	72 Amps
60 Amps	48 Amps	100 Amps	80 Amps

I hereby acknowledge that the information presented is a true and correct representation of existing conditions at the job site and that any causes for concern as to life-safety verifications may require further substantiation of information.

Signature of Permit Applicant: _____ Date: _____

- A. Projects with 1-25 stations: 5 business days to deem an application complete or incomplete, once the application is complete, 20 business days to issue an approval to build.
- B. Project with 26 or more stations: 10 business days to deem an application is complete or incomplete, once application is complete, 40 business days to issue an approval to build.
- *The business days to issue an approval to build only account for time spent pending review and in queue to be issued.*

Residential Applications:

Note: This is a voluntary compliance alternative, and you may 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 form is at the user’s risk and carries no implied guarantee of accuracy. Users of this form are advised to seek professional assistance in determining the electrical capacity of a service panel.

Applicants should submit for an electrical permit via our PLUS Online Portal:

Register at: www.rivcoplus.org.

Application: [Master Online Application](#)

Submit to: www.rctlma.org/building.

Having trouble? Please contact PlusAssist@rivco.org.



SAM SHAHROURI
DEPUTY DIRECTOR OF TLMA
BUILDING OFFICIAL

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LEVEL 2 ELECTRIC VEHICLE CHARGER – SERVICE LOAD CALCULATION

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 EV charger). For each item checked (✓), fill-in the corresponding "Watts used" (refer to the "Typical usage" column for wattage information). Add up all the number 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 vary – for a more precise analysis, consult with an 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	3,000
	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	
	Instantaneous Hot Water at Sink	1,500 watts	
LAUNDRY CIRCUIT			
	Laundry Circuit	1,500 watts	1,500
	Electric Clothes Dryer	4,500 watts	
HEATING AND AIR CONDITIONING CIRCUITS			
	Central Heating (gas) and Air Conditioning	6,000 watts	
	Window Mounted AC	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 tank)	4,000 watts	
	Electric Tankless Water Heater	15,000 watts	
	Swimming Pool or Spa	3,500 watts	
	Other (describe):	watts	
	Other:	watts	
ELECTRIC VEHICLE CHARGER CIRCUIT			
	Electric Vehicle Charger Wattage Rating*		
(Add-up all the watts for the loads you have checked ✓) TOTAL WATTS USED →			

* Use name plate rating in watts or calculate as (ampere rating of circuit x 240 volts = watts)

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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 (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 upgrade the existing electrical service panel to handle the electrical load from the proposed EV charger.

Table 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 24,000	100 Amps	
	24,001 – 30,000	125 Amps	
	30,001 – 36,000	150 Amps	
	36,001 – 48,000	200 Amps	
	48,001 – 54,000	225 Amps	
	54,001 – 96,000	400 Amps	

** Please 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 be needed to satisfy the electrical load demand for the proposed EV charger.

OTHER HELPFUL INFORMATION FOR EV CHARGER INSTALLATIONS:

The table below illustrates the type of size of wire and conduit to be used for various EV charger circuits.

Size of EV Charger Circuit Breaker	Required minimum size of Conductors (THHN wire)	Ground Wire Size	Conduit Type and Size **		
			Electrical Metallic Tubing (EMT)	Rigid Nonmetallic Conduit – Schedule 40 (RNC)	Flexible Metal Conduit (FMC)
30 Amps	#10	#10	1/2"	1/2"	1/2"
40 Amps	#8	#10	1/2"	1/2"	1/2"
50 Amps	#8	#10	1/2"	1/2"	1/2"
60 Amps	#6	#10	3/4"	3/4"	3/4"
70 Amps	#4	#8	3/4"	1"	1"
80 Amps	#4	#8	3/4"	1"	1"
90 Amps	#3	#8	1"	1"	1"
100 Amps	#2	#8	1"	1"	1-1/4"

** Based on 4 wires in the conduit (2-current carrying conductors, 1-grounded conductor, 1-equipment ground).

An alternate, Nonmetallic Sheathed Cable (aka: Romex or NMC) may be used if it's protected from physical damage by placing the cable inside a wall cavity or attic space separated from the occupied space by drywall or plywood.

The table below illustrates the required supports for various types of electrical conduit or cable.

Conduit Support	Electrical Metallic Tubing (EMT)	Rigid Nonmetallic Conduit – Schedule 40 (RNC)	Flexible Metal Conduit (FMC)	Nonmetallic Sheathed Cable (NMC)
Conduit Support Intervals	10'	3'	4-1/2'	4-1/2'
Maximum Distance from Box to Conduit Support	3'	3'	1'	1'

In addition to the above noted requirements, the California Electrical Code contains many other provisions that may be applicable to the installation of new electrical circuits. For additional information or guidance, consult with an Electrical Professional.

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GENERAL INSTALLATION GUIDELINES FOR RESIDENTIAL EV CHARGERS

1. GENERAL REQUIREMENTS – All Electrical Vehicle Charging Systems shall comply with the applicable sections of the current Building Codes, California Electrical Code, including Article 625.
2. EQUIPMENT HEIGHT – The coupling means of the Electrical Vehicle Supply Equipment shall be stored at a height of 18 – 48 inches above the finished floor [CEC Art 625.50].
3. LISTED EQUIPMENT – All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory.
4. FASTENED IN PLACE – Electric Vehicle Supply Equipment must be permanently connected and fastened in place in accordance with the manufacture's installation instructions [CEC Art 625.44(B)].
5. IF MORE THAN 60 AMPS – When EV charging equipment is rated at more than 60 Amps, the disconnect means shall be provide and installed in a readily accessible location and shall be capable of being located on the open position [CEC Art 625.43].
6. PROTECTIONS FROM PHYSICAL DAMAGE – Electrical Vehicle Supply Equipment shall be protected against vehicle impact damage when located in the path of a vehicle. In order to avoid the installation of a substantial pipe bollard as an equipment guard, locate the Electrical Vehicle Supply Equipment on a garage side wall, out of the vehicular path [CEC Art 110.27(B)] (see example below).
7. GCFI PROTECTION – All receptacles installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection [CEC 625.54] (*Not applicable to hardwired EVSE*).
8. WET LOCATIONS – Receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed [CEC 625.56].
9. EV OUTLET LABEL – The following permanent label shall be installed on the EV Outlet.
 - Max EV Charger Rating _____ Amps

SAMPLE ELECTRICAL FLOOR PLAN FOR ELECTRIC VEHICLE CHARGER INSTALLATION

