



City of San Juan Bautista

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Residential Electric Vehicle Charging System (EV)

GENERAL INFORMATION

The purpose of this informational handout is to assist property owners and contractors/builders who may choose to install an electric vehicle charging system (EV). The information presented provides general requirements and specifications for the installation. When projects deviate from the information presented in this handout or the Building Code, a California License Design Professional should be consulted.

CHECKLIST

One complete set of construction plans including

- A Site Plan
- An Electrical Plan
- Electrical Load Calculations
- Manufacture's Installation Specification

GENERAL REQUIREMENTS

Level 1 EV Charging; (120V)

- Type of equipment being installed:
 NEMA 5-15
- Equipment Overcurrent Protection Rating:
 15A 20A
- Existing Electrical Service
(If less than 150A see electrical load worksheet)
 100A
- Branch Circuit Distance:
 100 Feet or less
- Feet Conductor Size:
 #14 Cu #12 Cu

Level 2 EV Charging; (240V)

- Type of equipment being installed:
 NEMA 14-50
- Equipment Overcurrent Protection Rating:
 50A Other
- Existing Electrical Service
(If less than 150A, see electrical load worksheet)
 125A 150A 200A
- Branch Circuit Distance:
 More than 100 Feet
- Feet Conductor Size:
 #6 Cu Other

Sample Site Plan

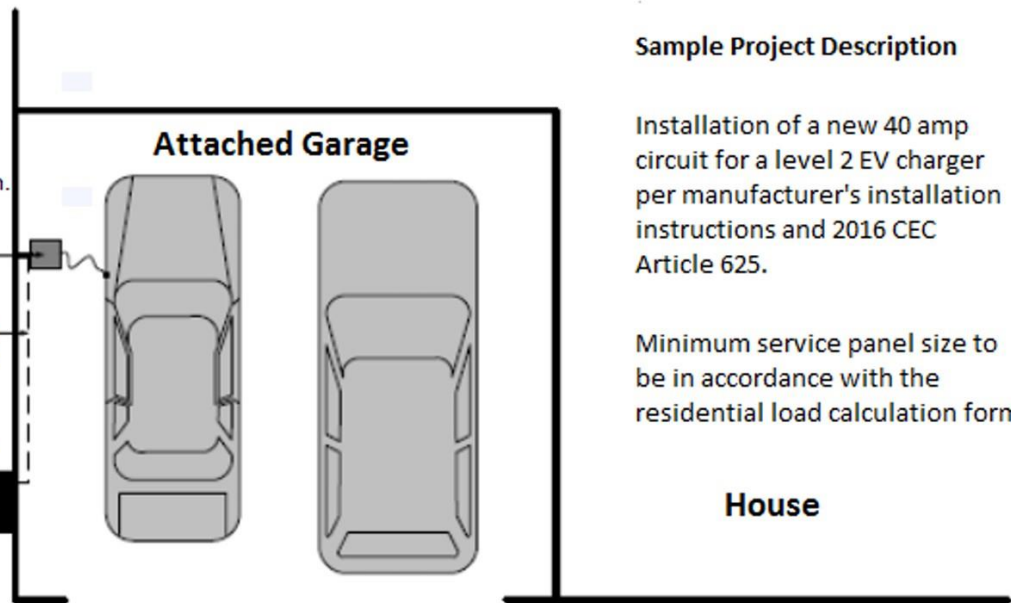
Sample Electrical Requirements

Vehicle batteries listed as suitable for charging indoors without ventilation.

New 40 amp rated level 2 EV Charger

New 3/4" EMT conduit with #8 THHN c.u. and #10 THHN c.u. ground

New 40 amp circuit breaker installed in the existing 200 amp electric meter panel



Sample Project Description

Installation of a new 40 amp circuit for a level 2 EV charger per manufacturer's installation instructions and 2016 CEC Article 625.

Minimum service panel size to be in accordance with the residential load calculation form.

CODE SECTION REFERENCE

According to NEC code 625.22, EV chargers must include a "personnel protection system" that prevents shocks. Typically, that means an "interrupting device," which blocks the flow of electricity for disconnected circuits.

5.106.5.3.1 EV Capable Spaces

New EV capable spaces shall be provided in accordance with Table 5.106.5.3.1 and the following requirements:

1. Raceways complying with the California Electrical Code and no less than 1-inch (25 mm) diameter shall be provided and shall originate at a service panel or a subpanel(s) serving the area, and shall terminate in close proximity to the proposed location of the EV cable space and into a suitable listed cabinet, box, enclosure or equivalent. A common raceway may be used to serve multiple EV cable spaces.
2. A service panel or subpanel(s) shall be provided with panel space and electrical load capacity for a dedicated 208/240 volt, 40-ampere minimum branch circuit for each EV cable space, with delivery of 30-ampere minimum to an installed EVSE at each EVCS.
3. The electrical system and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each EV capable space.
4. The service panel or subpanel circuit directory shall identify the reserved overcurrent protective device space(S) as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

Electrical Calculation Worksheet

LOAD ESTIMATING - OPTIONAL METHOD (CEC 220.82 or 220.83)

for Dwellings with 120/240, 3 wire, single phase services:

_____	Sq. Ft. living area ¹ x 3 watts/sq. ft.	0	watts
_____	- 20 amp small appliance circuits @ 1500 watts each	0	watts
_____	- laundry circuits @ 1500 watts each	0	watts

Electrical Appliances @ nameplate value²

range			watts
oven			watts
dishwasher			watts
garbage disposal			watts
dryer ³			watts
other (1 - 120v fans)			watts
other _____			watts
Subtotal		0	watts

First 10,000 watts @ 100% for New Dwelling

Or 8,000 watts @ 100% for Existing Dwelling Existing 8,000 watts

Balance 0 @ 40% 0 watts

*Air conditioning @ 100% (or) _____ Amps 0 watts

*Central elect. space heating @ 100% (or) _____ watts

*Less than 4 separately controlled elect. space heaters @ 100% _____ watts

plus controlled elect. space heaters more than 4 @ 40% _____ watts

Total Existing Load 0 watts

New Added Load _____ watts

Revised Total Load 0 watts

convert to amps by dividing by 240 volts (I=P/E) 0.0 AMPS

¹ use outside dimensions

² if values are given in amps, multiply by volts to obtain watts (P=Ix E)

³ minimum 5000 watts

⁴ if added load is for a level 2 electrical vehicle charging station load is
240v 7.7 kVA @ 125% = 9,625 watts

*use larger connected load of a/c and space heating, but not both.