This handout is designed for assistance in submitting plans for residential electric vehicle (EV) charging stations to the Building and Safety Department. Omission of any of the following plan review items shall be deemed an incomplete submittal and the plans will not be accepted for plan review.

All plans submitted for EV charging systems must comply with, and reference, the 2016 California Building Standards Code that became effective on January 1, 2017, including the 2016 California Residential Code (CRC), 2016 California Electric Code (CEC), 2016 California Plumbing Code (CPC), and 2016 California Mechanical Code (CMC) as appropriate including any amendments and/or errata.

The City of Menifee Building and Safety Department has a plan check wait time of up to 7 business days.

The City of Menifee does not currently perform any over-the-counter plan reviews due to staffing levels.

TYPES OF ELECTRIC VEHICLE (EV) CHARGERS

Be aware that there are different types of Electric Vehicle (EV) chargers. There are 2 basic types of EV chargers for home use: Level 1 and Level 2

LEVEL 1

Level 1 chargers are smaller units that plug directly into a standard 120 volt receptacle outlet. These types of chargers typically require a longer period of time to recharge the vehicle. As long as the receptacle outlet being used to plug in the Level 1 charger exists, there is no requirement to secure a permit from the Building and Safety Division. On the other hand, if you will be installing a new 120 volt receptacle outlet for the charger, you will need to obtain a permit and provide the required information in this handout. CBC 105.1

Level 2

A Level 2 EV charging system requires a 240 volt electrical circuit and charges the vehicle battery much faster than a Level 1 charger. Level 2 charger installations typically require an electrical permit and inspections of the installation. In order to obtain the permit you will need to provide some basic information to show that your existing electrical service can handle the added load. CBC 105.1

Requirements for Permit Submittal

Before approval and issuance of permit(s) for electric vehicle charging station, the applicant shall submit three (3) sets of plans (minimum size 8 ½”x 11”), which are drawn to scale (or at the very minimum are fully dimensioned), readable, and legible with a minimum of #12 font for text. Electronic plans that are designed to be printed at a minimum of 8 ½” x 17” in size and meeting the requirements listed above (one set of plans shall be required for electronic plans), electronic plans may be submitted to solar@cityofmenifee.us

All plans shall include the following information:

1. **Cover Sheet** showing the following information: (a) project address; (b) owner's name, address, and phone number; (c) name, address, and phone number of the person preparing the plans; (d) scope of work statement; (e) number of stories and number of dwelling units; (f) sheet index indicating each sheet title and number; (g) legend for symbols, abbreviations, and notations used in the drawings; CBC 107.2.5

2. **Site Plan** showing: Building footprint with locations of property lines, distances of building walls to property lines, location of the EV charging system, location of the main service and the exterior and interior locations of all equipment and disconnects with working space clearances, and locations of other structures (if any) on the property; CBC 107.2.5

3. **Electrical Plan** showing: A single line diagram indicating all conductor sizes and conductor types; location and size of all disconnects; location and size of all electrical service and electrical sub-panels; size of all overcurrent protection devices (circuit breakers); location of size of all receptacles outlets that will be installed; CBC 107.2.1

4. **Load Calculations:** Load calculations shall be provided for the existing electrical system in order to determine if the new loads of the EV charger can be added to the system; 2016 CEC Article 220

5. **Manufacturer's Specification Sheets** with make, model, and listing for all components. Provide two (2) sets of all manufacturer installation manuals for the charger as well as the manufacturer's specification sheets for any addition electrical equipment that will be installed; CBC 107.2.1

6. **Additional Information:** Please see the additional material provided below and on the other attached sheets to assist in the design of the system.

Equipment height
The coupling means of the Electric Vehicle Supply Equipment shall be stored at a height of not less than 18 inches above the floor level for indoor locations and not less than 24 inches above the grade level for outdoor locations. CEC 625.50

Listed equipment
All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory. CEC 110.3(B)

Fastened in place
Specify if the Level 2 Electric Vehicle Supply Equipment will be permanently connected and fastened in place in accordance with the manufacturer's installation instructions.

Protection 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 110.27(B))

The table below illustrates the type and 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; THHW wire for exterior)	Conduit Type and Size *		
		Electrical metallic Tubing (EMT)	Rigid Nonmetallic Conduit - Schedule 40 (RNC)	Flexible Metal Conduit (FMC)
20 amps	#12	1/2”	1/2”	1/2”
30 amps	#10	1/2”	1/2”	1/2”
40 amps	#8	3/4”	3/4”	3/4”
50 amps	#8	3/4”	3/4”	3/4”
60 amps	#6	3/4”	3/4”	3/4”
70 amps	#4	3/4”	3/4”	3/4”
* Based on 4 wires in the conduit (2-current carrying conductors, 1-grounded conductor, and 1-equipment ground). (CEC Chapter 9 Tables) As an alternate, Nonmetallic Sheathed Cable (NMC) (e.g., Romex cable) may be used if it is protected from physical damage by placing the cable inside a wall cavity or attic space which is 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) (CEC 358.30(A))	Rigid Nonmetallic Conduit - Schedule 40 (RNC) (CEC 352.28(B))	Flexible Metal Conduit (FMC) (CEC 348.42(B))	Nonmetallic Sheathed Cable (NMC) (CEC 334.30)
Conduit Support Intervals	10’	3’	4-1/2’	4-1/2’
Maximum Distance from Box to Conduit Support	3’	3’	1’	1’

Free to use code books are available from the State of California Building Standards commission at:
https://www.dgs.ca.gov/BSC/Codes

MENIFEE
BUILDING & SAFETY

Owner: _____ Location: _____

Total Floor Area of Dwelling (CEC 220.12) _____ SQFT.

Factor	**Quantity**		**Volt Amperes (VA)**
"General Lighting"			
1. General Lighting (SQFT X 3 VA/SQ FT (Table 220.12)	3 X sqft.		
2. Small Appliance Circuits (1500 VA per circuit) (CEC 220.52(A)) (minimum 2)	1500 X		
3. Laundry Circuit (1500 VA per circuit) (CEC 220.52(B))	1500 X		
4. Total General Lighting Load (Add lines 1, 2 & 3):			
5. First 3000 VA @ 100%:			3000
6. Total General Lighting Load – 3000 =_____ @ 35%=			
7. **Net General Lighting Load** (Per CEC 220.42) **(Add lines 5 & 6):**			
***Fixed Appliances(if insufficient space, use back):**	YES	NO	
• Garbage Disposal	☐	☐	
• Bathroom Fan	☐	☐	
• Microwave	☐	☐	
• Dishwasher	☐	☐	
• Other:	☐	☐	
• Other:	☐	☐	
		Total	
8. 3 or less Appliances, Total Appliance VA; 4 or more Appliances, 75% of Total Appliance VA (CEC 220.53):			
***Other Loads (including motors, EV charger(s), etc.)**	YES	NO	Nameplate Rating (VA)
9. Electric Range (8000VA or Nameplate)**	☐	☐	
10. HVAC	☐	☐	
11. Electric Oven	☐	☐	
12. Electric Dryer (5000 VA minimum)**	☐	☐	
13. Electric Vehicle Charger	✔		
14. Other:	☐	☐	
15. Other:	☐	☐	
16. 25% of largest motor (CEC 430.24)			
Total Service Load Volt-Amperes (VA) (Add lines 7, 8 & 9 thru 16) =			
Total Service Load Volt-Amperes / 240-volts = Amperes			
***Service Rating (Amperes)=**			

* For every "YES" answer, indicate VA rating of equipment
** Nameplate rating must be used if larger
*** Service Rating shall be greater than or equal to the Service load

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 Breakers (Amps) ***
☐	Up to 24,000 W	100 amps	
☐	24,001 - 30,000 W	125 amps	
☐	30,001 - 36,000 W	150 amps	
☐	36,001 - 48,000 W	200 amps	
☐	48,001 - 54,000 W	225 amps	

* Note: 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