This guideline is developed by the Tri-Chapter Uniform Code Committee and is intended to enhance regional consistency in application and enforcement of the Building Code(s). Please verify acceptance of this guideline with your local building department prior to its application.

ISSUE (S):

Efficient permitting and inspection for Electric Vehicle Service Equipment (EVSE) is beneficial to help encourage the use of Plug-in Electric Vehicles (PEV) in California.

On October 8, 2015 the Governor signed into law Assembly Bill No. 1236, which specifies consistent statewide standards for the installation of Electric Vehicle Supply Equipment (EVSE). This Bill mandates that cities and counties adopt a local ordinance that is consistent with the goals and intent of the bill, specifically an expedited permitting and inspection process, and a checklist identifying the details to qualify for the expedited process.

INTENT:

The intent of this document is to help ensure that permits and inspections for the installation of EVSE are expedited and streamlined with minimal delays. Ideally with the proper documentation, permits to install Electric Vehicle Supply Equipment (EVSE) can be expedited either over-the-counter or via a jurisdiction’s online permitting process, without compromising the code requirements or safety of the installation.

It is not the intent of this document, nor should it be part of the permitting process to be concerned with the design or practicality of any EVSE system. EVSE products, charger location, charging capacity, charging times, and overall feasibility vary with the home, the vehicle, and the consumer’s needs. These matters are best determined by designers and vehicle manufacturers. Applicants interested in design issues may also refer to the recommendations contained in the most current version of “Plug-in Electric Vehicle Infrastructure Permitting Checklist” published by the California Office of Planning and Research. (https://www.opr.ca.gov/s_zero-emissionvehicles.php)
DEFINITIONS AND ACRONYMS:

EVSE = Electric Vehicle Supply Equipment. This is the equipment that is installed between a source of electricity and the electric vehicle connection.

PEV = Plug-in Electric Vehicle. A vehicle that either runs entirely on electricity or a combination of electricity and another source of fuel.

Hybrid = A vehicle that runs on a combination of electricity and another source of fuel.

Charger = A device that converts household AC power to DC power and regulates the charging of the PEV batteries.

Level-1 Charging = (120 VAC, 15Amp or 20Amp).

Level-2 Charging = (240 VAC, 30 - 100Amp).

Level-3 Charging = Fast DC Charging. Many vehicles have the capability to be connected to a DC Fast Charger, however these chargers are not practical for residential use due to the high electrical demand.

Hard-Wired or Permanently Wired = EVSE that is directly wired into the home’s electrical wiring.

Cord and Plug Connected = The EVSE is plugged into an outlet that is either existing or installed for the purpose.

Typical EV Charging System

The chargers for Level 1 and 2 systems are actually located on-board the vehicle. The Electric Vehicle Supply Equipment (EVSE) is the interface device between the vehicle charging system and the household power. EVSE consists of the connector, cord, control device, and interface to the household power. The connector at the vehicle is typically a standard SAE J1772 coupler (with adapters available for those vehicles using a different style connector). At the other end, the device may be directly hard-wired to the home or it may be connected via a cord and plug.

Level-1 systems operate on a standard 120 volt wall outlet. This outlet may be existing on the premises, but consideration needs to be given to the minimum amperage requirements of the EVSE and what other
electrical loads are on the circuit. It is recommended that a circuit dedicated solely to the EVSE be used.
The installation of a new outlet for this purpose would require a permit and inspection. Load calculations
should be performed to determine adequacy of the electric service, however for a Level-1 system the
additional load on most residential electrical services is likely negligible.
Plug-in Hybrid Vehicles (that use both gas and electric), and those people not concerned about long
charging times, may be served adequately by Level-1 EVSE.

Level 2 systems are commonly desired because of the lesser time needed to charge the vehicle. They can
range from a 30-amp system all the way up to 100-amps. Thus the size of the system, and the home’s
capacity to support it, are critical to code compliance. Level-2 systems and circuits will always require a
permit and inspection. In some cases the home’s electric service may need to be upgraded. Load
calculations on the home are the only way to determine if the existing electrical service has the capacity
for a Level-2 charger. There are devices available that remove an existing load from the dwelling in order
to facilitate the load of the charger. These devices do not allow both loads (such as an electric dryer) to
operate simultaneously; therefore, the larger of the two loads can be used in the calculations. Such
devices should be UL listed to applicable product safety standards.

PROPOSED GUIDELINE AND CHECKLIST:

Unless an existing circuit is determined to be adequate for a Level-1 EVSE device, an electrical permit is
required for an EVSE system or for the installation of a circuit/outlet for a cord and plug connected unit.

The following information is required for a permit:

1. Owner should work with a contractor or EVSE professional to determine the vehicle’s specific needs
   and vehicle owner’s expectations. Referencing the vehicles owner’s manual may provide valuable
   information on charging. Once the details have been determined then the permit process may
   proceed.

2. Identify the make and model of the proposed EVSE system. The system must be listed by an
   approved nationally recognized testing laboratory in accordance with UL 2202, “Standard for Electric
   Vehicle (EV) Charging System Equipment”.

3. Identify the EVSE location on the permit application. EVSE shall be installed in accordance with
   manufacturer’s installation instructions and be suitable for the environment (indoor/outdoor).

4. Identify if the system is Level-1 or Level-2.

5. Provide the required circuit ampacity identified on the EVSE documentation. Identify the amperage
   rating of the circuit on the permit application. Use this rating for the load calculations.

6. Provide existing electrical service panel information and load calculations for the residence. Include
   EVSE load and circuit size to determine if an electrical service panel upgrade is required.

7. Contact the local utility company and advise them of the additional loads on the electric service.
   Identify if a second electric meter is required to be installed because of electric utility rate for EV
   charging.

8. Manufacturer installation instructions must be available for the inspector at the site.

9. Electrical wiring and installation shall be in conformance with the current edition of the California
   Electrical Code, including Article 625.
CODES AND REFERENCES:

2016 California Electrical Code
2016 California Green Building Standards Code
UL 2202 listed EV charging system
Zero-Emission Vehicles in California: Community Readiness Guidebook
(https://www.opr.ca.gov/s_zero-emissionvehicles.php)

Typical EVSE Location

EVSE location per the manufacturer’s installation instructions and CEC

EVSE shall be protected as necessary to prevent damage by automobiles