APPENDIX

San Diego
PLUG-IN ELECTRIC VEHICLE (PEV) READINESS PLAN

Phase One Regional PEV Assessment

APPENDIX

Plug-in Electric Vehicle (PEV) Readiness Planning Best Practices

Complied by the California Center for Sustainable Energy (CCSE)

Zoning and Parking

Throughout California, the US and Canada, a number of cities have implemented electric vehicle supply equipment (EVSE) installation zoning ordinances in an effort to promote the deployment of PEVs and charging infrastructure. The following section provides a brief description of policies and mandates that other cities and states have implemented in regards to parking capacity regulations for PEVs and other alternative-fuel vehicles, parking enforcement procedures for spaces with electric vehicle infrastructure and accessibility standards for PEV parking.

Best Practices

Parking Capacity

Los Angeles County
Designated parking 8% for any combination of low emitting, fuel-efficient, and carpool/van pool vehicles. The parking provider must make available appropriate marking or signs.

California Green Building Standards Code
A5.106.6 Parking Capacity. Design parking capacity to meet but not exceed minimum local zoning requirements.

A5.106.6.1 Reduce parking capacity. With the approval of the enforcement authority, employ strategies to reduce on-site parking area by

1) Use of on street parking or compact spaces, illustrated on the site plan or
2) Implementation and documentation of programs that encourage occupants to carpool ride share or use alternate transportation.

California Green Building Standards Code
Nonresidential Mandatory Measures
5.106.5.2 Designated parking. Provide designated parking for any combination of low emitting, fuel-efficient and carpool/van pool vehicles, including PEVs for up to 10% of total designated parking spaces.
5.106.5.2.1 Parking stall marking. Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle.

City of Vancouver, British Columbia, Canada
13.2.1. Electric Vehicle Charging
13.2.1.1. Parking Stalls
1) Each one of the 20% of the parking stalls that are for use by owners or occupiers of dwelling units in a multi-family building that includes three or more dwelling units, or in the multi-family component of a mixed use building that includes three or more dwelling units must include a receptacle to accommodate use by electric vehicle charging equipment.

State of Hawaii
Hawaii State Legislature passed Act 156, the "Hawaii State Plug-in Electric Vehicle Parking Requirement."
The law states:

All public, private, and government parking facilities that are available for use by the general public and that include at least one hundred parking spaces must designate at least 1% of the spaces specifically for EVs by December 31, 2011. The spaces designated for EVs will continue to increase by 1% for each additional 5,000 registered EVs until the percentage reaches 10%.[1]

This law was revised in 2012 to Act 089 or SB 2747 to require that:

Places of public accommodation with at least 100 parking spaces available for use by the general public designate at least one space for the exclusive use of EVs, and are equipped with an EV charging system by July 1, 2012.[2]

Parking Enforcement

City of Santa Monica
3.12.835 Electric vehicle parking: The Director of Planning and Community Development, or his or her designee, is authorized to designate parking spaces or stalls in an off-street parking facility owned and operated by the City of Santa Monica or the Parking Authority of the City of Santa Monica for the exclusive purpose of charging and parking a vehicle that is connected for electric charging purposes. (Adopted at City Council Meeting 07/24/2012)[3]

Accessibility

The City of San Diego
Technical Policy 11B-1: Accessibility to Electric Vehicle Charging Stations: The City of San Diego requires public accommodations and services be made accessible to persons with disabilities. Technical Policy 11B-1 requires that a ratio of parking spaces with EVSE in existing or new construction be accessible. A full detail of the specifications for disabled accessible EV charging stations and requirements can be found below.

County of Sonoma
Electric Vehicle Charging Station Program and Installation Guidelines[4]
Existing Parking Facilities
The first charger may also be installed at an existing accessible parking space that is also part of the required number of accessible stalls for that parking lot; provided signage clarifies that this stall can be used for accessible parking and/or electric vehicle charging by vehicles displaying a DP placard or license plate.

New Buildings, Site Construction or Redevelopment
When EVSE are planned as part of a new building, a redevelopment or major site reconstruction at least one EVSE in ten (10) shall comply with the accessibility requirements in the C.B.C. Title 24 and A.D.A. The one in ten ratio is not an A.D.A. requirement, but one developed by the County of Sonoma "Permit and Resource Management Department." When equipped with card readers, the C.B.C. requires the first two EVSE to be accessible.

Signage for PEV Parking

U.S. Department of Transportation Federal Highway Administration (FHWA)
EV Charging General Service Symbol Sign: The United States FHWA adopted the General Service symbol at the request of the Oregon and Washington Departments of Transportation. The PEV Collaborative supports the use of standardized signs to minimize confusion and provide the greatest ease of use for PEV drivers. To this end, the Collaborative recommends that Cal Trans adopt the use of the candidate signs currently being tested in Oregon and Washington, and that local jurisdictions request the use of those signs during the test period with the expectation that they will ultimately be approved at the federal level and become the uniform standard nationally.

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[1] Alternative Fuels & Advanced Vehicles Data Center. (2011 June 15). Hawaii Incentives and Laws for EVs. Retrieved from http://www.afdc.energy.gov/afdc/laws/laws/HI/tech/3270
[2] Ibid
[3] http://www.smgov.net/departments/council/agendas/2012/20120724/s2012072407-A-1.htm
[4] http://www.sonoma-county.org/prmd/docs/misc/ev_prog_guidelines.pdf

Proposal to the California Manual on Uniform Traffic Control Devices

The California Department of Transportation, Sonoma County Department of General Services, and, the California Plug-In Electric Vehicle Collaborative requested that the following 5 new signs, 2 updated sign codes for existing signs; and, optional pavement markings be considered for the *California Manual on Uniform Traffic Control Devices, 2012 edition* (CA MUTCD) for Electric Vehicle Charging Station locations. Examples of the new signs and updates are included below:

Regulatory Signs

PEV Tow-Away Symbol: This sign indicates that vehicles will be towed if not utilizing the available charging station (per CVC 21511). This sign will include the tow-away symbol with the following language "UNAUTHORIZED VEHICLES NOT CONNECTED FOR ELECTRIC CHARGING PURPOSES WILL BE TOWED AWAY AT THE OWNER'S EXPENSE . . ." with red text on a white background and be 24" x 24".

No Parking Symbol: This sign indicates no parking unless for charging a PEV. This will include the following language "EXCEPT FOR ELECTRIC VEHICLE CHARGING" with red text on a white background and be 12" x 18".

Permissive Charging Symbol: This sign indicates the time that charging will be available and will include the following language "[Electric Vehicle] __ HOUR CHARGING - __AM TO __PM" with green text on a white background and be 12" x 18".

General Directional

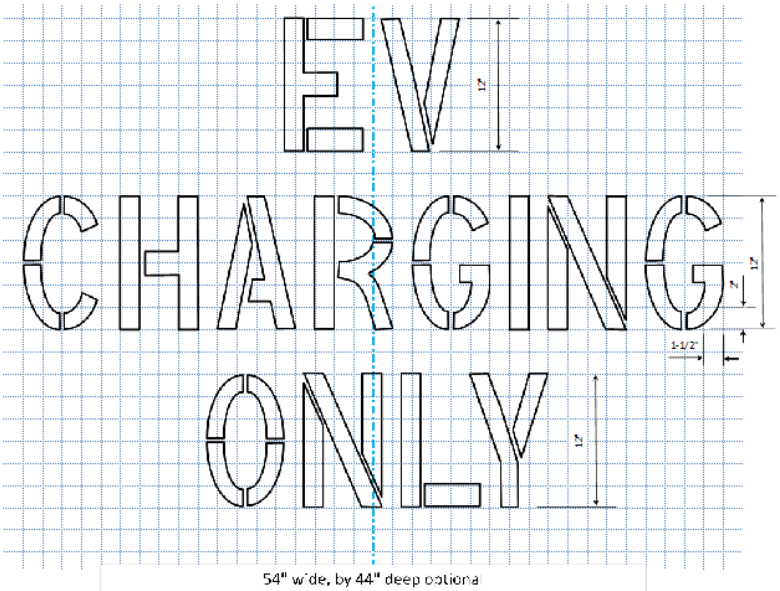
Electric Vehicle Charging Station symbol and word message signs: These signs will assist in directing PEV drivers to charging stations from the freeway, local streets and at charging locations. The sign includes the EV charging station symbol (shown) or the following text "ELECTRIC VEHICLE CHARGING STATION" with white text on blue background. Sign sizes should be 30" x 30" for freeway or major arterial highway application, 24" x 24" for local streets, and 18" x 18" off-street parking application.

Electric Vehicle Charging Station
Symbol Sign

ELECTRIC VEHICLE CHARGING STATION
Word Message Sign

FAST Electric Vehicle Charging Station: This plaque indicates the charging station is capable of a charge in less than one hour (faster charge compared to a Level 2 station). The sign will include the language "FAST" in white text on a blue background and be 24" x 6" or 30" x 8". This plague is for use only with the Electric Vehicle Charging station symbol and word message.

Optional EV charging Pavement Marking**:** This pavement marking will indicate a parking space is for EV charging only for on- and off-street electric vehicle charging station stalls. The pavement marking will include the following language "EV CHARGING ONLY" in white text



54" wide, by 44" deep optional
EV CHARGING ONLY Pavement Marking detail

City of San Diego Technical Policy 11B-1 Specifications and Requirements:

New Construction: The accessible EV charging station(s) must be located in close proximity (DSA recommends within 200 ft.) to a major facility, public way or a major path of travel on the site. This policy is in conjunction with new buildings or parking facilities such as surface parking lots or parking garages.

Existing Sites: An accessible path of travel connecting the accessible EV charging station to a major facility, public way or major path of travel on the site is required to the extent that the cost of providing such path does not exceed 20% of the cost of the EV equipment and installation of all EV charging stations at the site over a three-year period.

Number of Accessible EV Charging Stations Required: When the number of EV charging stations proposed exceeds 25, they shall be provided at a rate of one accessible EV charging station for every 25 stations proposed. Not more than a total of 4 accessible EV charging stations are required on the same site.

Identification for Accessible EV Charging Stations: To identify an accessible EV charging station an informational sign must be posted which reads, "Parking for EV Charging Only; This Space Designed for Disabled Access; Use Last." When an EV charging station is placed in conjunction with an accessible parking space this sign shall be omitted.

Dimensions for Accessible EV Charging Stations: The charging equipment, and when applicable card readers, must meet all applicable reach range provisions of CBC Section 1118B and Ch. 11C for a 30 by 48 inch wheelchair space used for side or front approach. (ii) A clear path of travel measuring not less than 36 inches in clear width shall be provided to access the charging equipment.

The EV charging station shall include a space to place the electric vehicle that is not less than 9 foot wide by 18 feet deep to accommodate the vehicle. The space shall also include a 5 ft. wide access aisle that extends the full depth of the vehicular space and located on the passenger side of the vehicle. Alternatively, the access aisle can be located between an accessible parking space and an accessible EV charging station. See figures 1, 2 and 3 for possible configurations.

Figure 1. Diagram of an EV charging station in an ADA accessible spot and a regular space.

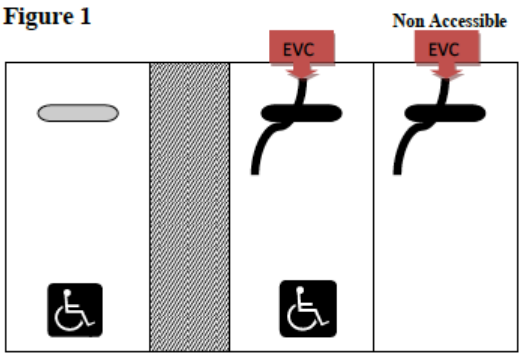


Figure 2. Diagram of an EV charging station installed in the ADA accessible spot, but with charging access in the ADA space and regular space.

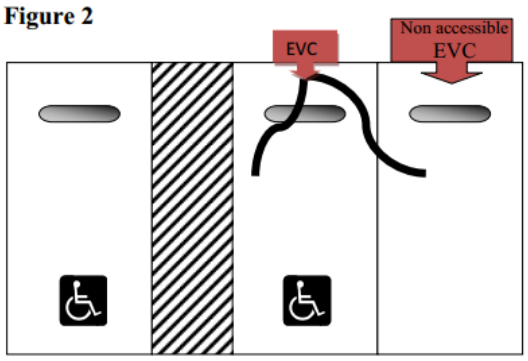
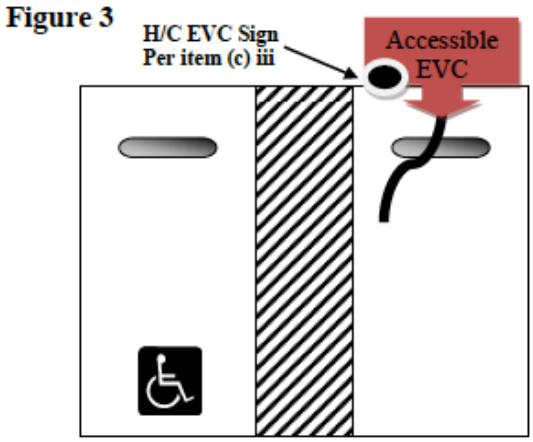


Figure 3. Diagram of one accessible EV charging station that is not designated as an ADA spot but designed to accommodate ADA requirements. In this case there needs to be signage that states "Parking for EV Charging Only; This Space Designed for Disabled Access; Use Last."



Issue Date: April 19, 2012
http://www.sandiego.gov/development-services/industry/pdf/tpolicy11b1.pdf
City of San Diego Development Services, Division of Building, Construction & Safety

Streamlining Permitting and Inspection

Throughout California and the US, a number of cities have implemented EVSE permitting and inspection requirements in an effort to streamline the installation process of EVSE. This section was designed to account for the entire permitting and inspection process and as a result, it is considerably longer than compared to the other sections. The following section provides a brief description of permitting and EVSE installation guidelines prepared by the cities of **San Diego** and **Oceanside** and survey results for each of the jurisdictions that participated in the survey.

Best Practices

The permitting guidelines designed by two cities in the region, The City of San Diego and the City of Oceanside, are included in the following pages, in the order listed below:

City of San Diego: *How to Obtain a Permit for Electrical Vehicle Charging Systems, Information Bulletin 187*

City of Oceanside: *Residential Electric Vehicle Charger Guidelines*

THE CITY OF SAN DIEGO

HOW TO OBTAIN A PERMIT FOR

Electrical Vehicle Charging Systems

CITY OF SAN DIEGO DEVELOPMENT SERVICES
1222 FIRST AVENUE, MS 301 SAN DIEGO, CA 92101-4101
CALL (619) 446-5300 FOR APPOINTMENTS AND (619) 446-5000 FOR INFORMATION

INFORMATION BULLETIN
187
MAY 2012

This information bulletin describes the permitting and inspection process for the installation of an Electrical Vehicle Charging System (EVCS) on an existing site or building.

EVCS installations shall comply with all applicable code requirements, City ordinances and regulations, including historical, and Land Development Code.

Electrical Vehicle (EV) supply equipment shall be listed and labeled by an OSHA-approved Nationally Recognized Testing Laboratory (NRTL)

Documents Referenced in this Information Bulletin

- **California Electrical Code, Article 625, (CEC)**
- **Information Bulletin 103, Mechanical, Plumbing/ Gas, Electrical Fee Schedule and Worksheet**
- **Circuit Card - Supplemental for Single Family Dwellings, DS-1179A**
- **Owner-Builder Verification, DS-3042**
- **General Application, DS-3032**

I. APPROVAL REQUIREMENTS

An Electrical Permit is required for the installation of an EVCS.

A Building Permit may be required if alterations will be made to the building or disabled accessible parking spaces serving the buildings on the site, or when new disabled accessible parking spaces are proposed.

II. DOCUMENTS AND PLANS REQUIRED

A. General Application, (DS-3032)

A General Application must be completed. If the property owner is doing the work, a separate Owner-Builder Verification form (DS-3042) must be completed and signed by the owner.

B. Plans

The following plans and calculations are required for review and approval. Plans and calculations for an EVCS installed in a residential private garage will be reviewed by the inspector during inspections. However for all other installations the plans have to be reviewed prior to permit issuance.

1. **Site plan** showing complete layout of existing parking spaces and proposed location of EVCS parking space(s), existing building and structures.

   Charging units are allowed to encroach within required zone setbacks, as described in SDMC 131.0140. Any landscaping required by SDMC 142.0402, including trees shall not be removed for the installation of the charging unit.

   Note: Per SDMC, Section 86.26, it is unlawful to park a vehicle so that it protrudes into the street or sidewalk. If the EV will be parked behind the City sidewalk, it is important to show the width of the sidewalk, the distance from the curb to the sidewalk, and the distance from the sidewalk to the house or garage on the site plan. Also, per SDMC Section 142.0510, an operable vehicle may be temporarily parked on a legal driveway within a required front or street side yard if the vehicle does not in any way impede access to or from more than one required parking space. The vehicle cannot be parked parallel to the property line.

2. **Floor plan** showing the ECVS when the system is located within a building.

3. **Electrical plans and calculations** prepared, signed and stamped by a California registered Electrical Engineer or the California Licensed Electrical contractor who will be installing the system.

   Note: A completed City of San Diego Circuit Card (DS-1779A) will be accepted in lieu of electrical plans for installation in residential private garages; calculations shall be included on the Circuit Card. The Card shall be provided at the site for the inspection staff.

   Charging an EV or plug in EV adds a significant and continuous load to electrical services and will impact the regional electrical distribution system. Therefore, it is important to provide accurate electrical load calculations.

   The plans shall include the following information:
   a. Single line diagrams showing the system, point of connection to the power supply and the charging unit(s).
   b. Electrical load calculations.
   c. Electrical panel schedule

d. Manufacturers' data sheet for the listed charging equipment.
e. The amperage supplied to charge the electrical vehicle.

4. Disabled Accessibility Plans showing the following:

Note: Disabled accessibility plans are not required for EVCS installed in residential private garages.

a. The dimensioned layout of existing accessible parking spaces, including access aisles, and adjacent parking spaces used for the EV charging station.
b. The location and layout of proposed accessible EV charging station.
c. An elevation of the charging unit sufficient to demonstrate compliance with the reach ranges for side or front approach to the unit by persons with disabilities as required in the California Building Code.

III. OPTIONS FOR SERVICE

A. To obtain the electrical permit for installations in a residential private garage you may use our:

1. On-Line service at Simple E-Permit

2. Walk-in at the Development Services Department at 1222 1st Avenue, 3rd Floor Check-In counter. Walk-In service is also provided at our Inspection Office located at 9601 Ridgehaven Court, 2nd Floor.

B. To obtain electrical permits for installation in other locations a plan review is required prior to issuance.

1. Most EVCS reviews may be performed on a walk-in basis over the counter at the Development Services Center, 1222 1st Avenue, 3rd Floor. A General Application and two copies of the plans listed above are required for review and approval.

IV. INSPECTIONS

A. Access shall be provided to all equipment including the electrical service equipment that supplies power to the EVCS. Inspectors are not authorized to open energized electrical equipment. A responsible person shall be present to open any live electrical equipment for inspection.

B. In addition to all plans and calculations, the EVCS Manufacturer's installation instructions shall be provided on site at time of inspection.

C. All plans and documents listed above must be provided for residential private garages on site at time of inspection.

D. When applicable the approved perforated set of plans must be available on site at time of inspection.

V. FEES

Residential Private Garage Installations

Inspection	.8 hr. x $123	= $98.40
Issuance		= $38
Records		= $20

All other installations per unit

Electrical Plan Check	.5 hrs. x $144	= $72
Structural Plan Check	.5 hrs. x $144	= $72
Electrical Inspection	1.2 hrs. X $123	= $147.60
Issuance		= $38
Records		= $20

Hourly charges may be added for additional plan reviews and/or inspections.

VI. UTILITY SUB-METERED EVCS

If the customer decides that the EVCS installation will be metered by SDG&E for a specialized rate, the installation shall conform to the SDG&E PEV PILOT drawings. Contact SDG&E in advance for information regarding this program. When the installation is approved, the inspector will notify SDG&E. Please coordinate the installation of the meter with SDG&E.

City of Oceanside
Building Division
300 N. Coast Hwy
Oceanside, CA 92054
760-435-3950

Residential Electric Vehicle Charger Guidelines

The purpose of this guideline is to assist permit applicants in streamlining the Permitting, installation and inspection process for Residential 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 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 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 – but you will not need to provide any plans or electrical load calculations as would be required for the more powerful Level 2 type charging systems.

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.

What information do I need to provide in order to obtain the permit?
This Residential EV Charger Permit Guideline has been developed to streamline the permit, installation and inspection process. In most cases, you or your contractor merely need to fill-in the blanks on this document, attach the manufacturer's installation instructions and charger specifications and submit it to the Building Division for an over-the-counter review and permit issuance. If all of the information is provided and the proposal complies with the applicable codes, the review and approval process can usually be performed over-the-counter or within a day or two depending upon workloads and staffing levels at the time of submittal. Once the permit is issued, the installation may begin. When the installation is complete, an inspection of the work must be scheduled with the Building Inspector. Inspections are typically performed on the work day following your request for inspection. Keep in mind that someone will need to be present during the inspection so that the Building Inspector can access the location of the electrical meter and EV charger (typically in the garage).

Installing a Level 2 EV Charging system often requires changes to building's electrical wiring. Before installing the EV charging equipment and the associated wiring, talk to your EV manufacturer about the electrical requirements for the charger unit to be installed at your home.

When installing your EV charger, be sure to use a licensed Electrical contractor whose state contractor's license and insurance are current. The contractor should follow the installation instructions of the EV charger manufacturer and the requirements of California Electrical Code.

Why is the Electric Utility concerned about your EV charger installation?
Though an individual Level 2 EV charger may have a negligible impact on the utility electric system, the combined effect of several chargers in the same neighborhood could result in overloads on utility secondary wires and transformers. It is important that the Electrical Utility provider be notified of any Level 2 charger installations to ensure that utility electrical system components are adequately sized to maintain high levels of service reliability

Approved _____ Issue Date: October 12, 2012
R. Steven Jones, Building Service Administrator

LEVEL 2 ELECTRIC VEHICLE CHARGERS - 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 Level 2 EV 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	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	
	Garbage Compactor	1,000 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 type)	4,000 watts	
	Electric Tankless Water Heater	15,000 watts	
	Swimming Pool or Spa	3,500 watts	
	Other: (describe)	watts	
	Other:	watts	
	Other:	watts	
	ELECTRIC VEHICLE CHARGER CIRCUIT		
	Level 2 Electric Vehicle Charger Wattage Rating*		
(Add-up all of 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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R. Steven Jones, Building Service Administrator

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 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 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	

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 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 users 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.

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R. Steven Jones, Building Service Administrator

OTHER HELPFUL INFORMATION FOR EV CHARGER INSTALLATIONS:

The Table below illustrates the type and size of wire and conduit to be used for various Electric Vehicle Charger circuits.

Size of EV Charger Circuit Breaker	*Required minimum size of Conductors (THHN wire)*	*Conduit Type and Size****		
		Electrical Metallic Tubing (EMT)	*Rigid Nonmetallic Conduit – Schedule 40 (RNC)*	*Flexible Metal Conduit (FMC)*
20 amp	#12	1/2"	1/2"	1/2"
30 amp	#12	1/2"	1/2"	1/2"
40 amp	#10	1/2"	1/2"	1/2"
50 amp	#8	3/4"	3/4"	3/4"
60 amp	#6	3/4"	3/4"	3/4"
70 amp	#6	3/4"	3/4"	3/4"

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

As an alternate, Nonmetallic Sheathed Cable (aka: Romex Cable or NMC) 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)*	*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 a new electrical circuit. Installers are cautioned to be aware of all applicable requirements before beginning the installation. For additional information or guidance, consult with the Building Division staff or a qualified and experienced Electrical Contractor.

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R. Steven Jones, Building Service Administrator

GENERAL INSTALLATION GUIDELINES FOR LEVEL 2 RESIDENTIAL EV CHARGERS

1. GENERAL REQUIREMENTS - All Electrical Vehicle Charging Systems shall comply with the applicable sections of the California Electrical Code, including Article 625.

2. EQUIPMENT HEIGHT - The coupling means of the Electric Vehicle Supply Equipment shall be stored at a height of 18 – 48 inches above the finished floor. (CEC Art 625.29(B)).

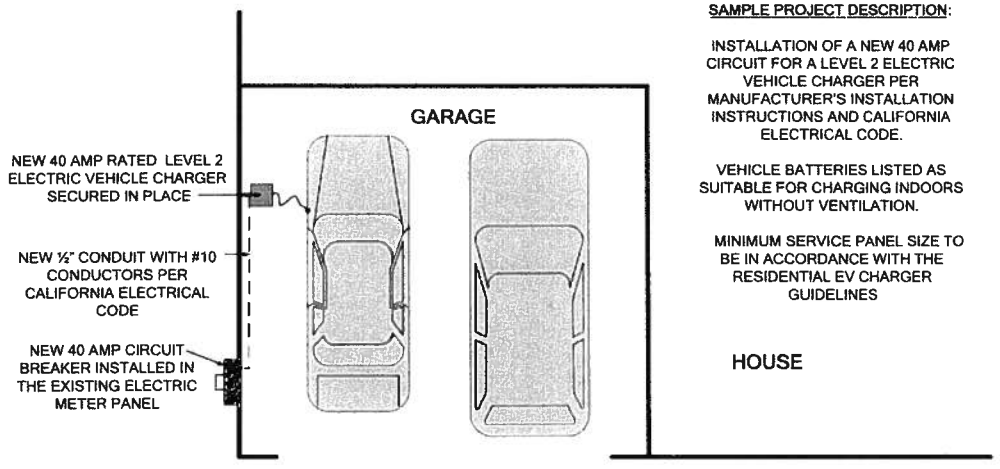
3. LISTED EQUIPMENT - All Electric Vehicle Supply Equipment shall be listed by a nationally recognized testing laboratory.

4. FASTENED IN PLACE - Level 2 Electric Vehicle Supply Equipment must be permanently connected and fastened in place in accordance with the manufacturer's installation instructions (CEC Art. 625.13).

5. 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 vehicular path. (see sample drawing below) (CEC Art. 110.27(B))

6. IF MORE THAN 60 AMPS- When EV charging equipment is rated at more than 60 amps, the disconnect means shall be provided and installed in a readily accessible location and shall be capable of being locked on the open position. (CEC Art. 625.23)

SAMPLE ELECTRICAL PLAN FOR LEVEL 2 ELECTRIC VEHICLE CHARGER CIRCUIT INSTALLATION



SAMPLE PROJECT DESCRIPTION:

INSTALLATION OF A NEW 40 AMP CIRCUIT FOR A LEVEL 2 ELECTRIC VEHICLE CHARGER PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND CALIFORNIA ELECTRICAL CODE.

VEHICLE BATTERIES LISTED AS SUITABLE FOR CHARGING INDOORS WITHOUT VENTILATION.

MINIMUM SERVICE PANEL SIZE TO BE IN ACCORDANCE WITH THE RESIDENTIAL EV CHARGER GUIDELINES

Approved _____ Issue Date: October 12, 2012

R. Steven Jones, Building Service Administrator

PEV Readiness Survey Results – Permitting and Inspection

The permitting and inspection section of the survey had thirteen participants. All percentages were always calculated by dividing by the total number of participants. Non-answers, or blank answers, were recorded as "no". Answers were recorded during personal phone calls conducted by CCSE staff and an online survey sent to San Diego regional municipal staff.

Permitting

How Jurisdictions Created Permit & Inspection Requirements for EVSE Installations

How EVSE Permit & Inspection Requirements Were Created	Jurisdiction
Developed requirements on own through staff	El Cajon, San Marcos, Carlsbad, Encinitas, Poway, City of San Diego
Consulted other agencies	Oceanside
Looked at other city or agency requirements	-
Have not developed requirements for EVSE yet	Chula Vista, Encinitas, Coronado, La Mesa, Imperial Beach

How Applicants Can Apply for a Permit by Jurisdiction*

Permit Application Methods	Jurisdiction
Online	Chula Vista, City of San Diego (online application for City of San Diego residents only available for residential EVSE installations)
Over the phone	Chula Vista
Over the counter	El Cajon, San Marcos, Chula Vista, Lemon Grove, Carlsbad, Encinitas, Poway, Coronado, La Mesa, Imperial Beach, Oceanside and the City of San Diego
Mail in hard copy application	San Marcos, Chula Vista, Carlsbad, Poway, La Mesa
Other	El Cajon – applicants can email plans to permitting office. Poway – applicants can fill out application online and submit in person.

*Jurisdictions may have more than one permitting method for applying for a permit for EVSE installations.

How Applicants Can Check the Status of a Permit by Jurisdiction*

Method to Check Status of Permit Application	Jurisdiction
Online	Chula Vista, Oceanside
Call the office	El Cajon, San Marcos, Chula Vista, Lemon Grove, Carlsbad, Encinitas, Poway, Coronado, La Mesa, Imperial Beach, Oceanside and the City of San Diego
Informed by mail	El Cajon, San Marcos, Chula Vista, Lemon Grove, Carlsbad, Encinitas, Poway, Coronado, La Mesa, Imperial Beach, Oceanside and the City of San Diego
Other	El Cajon – applicants can email the permitting office. Lemon Grove – applicants can email the permitting office. City of San Diego – applicants can visit the kiosk in the permitting office.

*Jurisdictions may have more than one method for checking the status of a permit for EVSE installations.

Costs of Permits by Type of EVSE Installation

Type of Installation	Permit Cost			
	<$100	$101-$250	$251-$500	>$501
Single Family Residence	San Marcos, La Mesa, Imperial Beach	El Cajon, Chula Vista, Lemon Grove, Carlsbad, Poway, Oceanside, City of San Diego	Encinitas, Encinitas	-
Commercial/Multi-Family Unit	San Marcos, La Mesa, Imperial Beach	El Cajon, Chula Vista, Carlsbad, Poway, Coronado	Lemon Grove, Encinitas, Oceanside, City of San Diego	-
Open Parking Lot	San Marcos, Imperial Beach	El Cajon, Chula Vista, Carlsbad, Poway, Coronado, La Mesa	Lemon Grove, Encinitas, City of San Diego	-
On-street Parking	San Marcos, Imperial Beach	El Cajon, Chula Vista, Lemon Grove, Coronado, La Mesa	Encinitas	Oceanside

The second respondent from the **City of Encinitas** did not provide an answer permit costs for commercial/multi-family, open parking lot and on-street parking EVSE installations. The **City of Carlsbad** did not provide an answer for on-street parking EVSE installations. The **City of Poway** stated that on-street parking EVSE installations were not permitted and the **City of San Diego** was not sure of the permit price for an on-street parking EVSE installations.

Time to Issue Permits by Type of EVSE Installation

Type of Installation	Time to Issue Permit				
	Same Day	2-5 Days	6-10 Days	3-5 Weeks	>5 Weeks
Single-Family Residence	Chula Vista, Lemon Grove, Carlsbad, Encinitas, Encinitas, Poway, Coronado, La Mesa, Imperial Beach, Oceanside	City of San Diego	El Cajon, San Marcos	-	-
Commercial/Multifamily Unit	Chula Vista, Carlsbad, Coronado	Poway	El Cajon, San Marcos, Lemon Grove, Encinitas, La Mesa Imperial Beach, Oceanside	City of San Diego	-
Open Parking Lot	Chula Vista, Carlsbad, Coronado	Poway	El Cajon, San Marcos, Lemon Grove, Encinitas, La Mesa, Imperial Beach, Oceanside	City of San Diego	-
On-street Parking	Chula Vista, Coronado	-	El Cajon, San Marcos, Lemon Grove, Encinitas, La Mesa, Imperial Beach,	Oceanside	-

The second respondent from the **City of Encinitas** did not provide an answer permit costs for commercial/multi-family, open parking lot and on-street parking EVSE installations. The **City of Carlsbad** did not provide an answer for on-street parking

EVSE installations. The **City of Poway** stated that on-street parking EVSE installations were not allowed and the **City of San Diego** was not sure of the permit price for an on-street parking EVSE installations.

Type of Permit by EVSE Installation*

Type of Installation	Type of Permit				
	Building	Electrical	Planning Entitlement	Building & Electrical	Other Type of Permit
Single-Family Residence	-	El Cajon, San Marcos, Lemon Grove, Carlsbad, Encinitas, Encinitas, Coronado, La Mesa	San Marcos	Chula Vista, Poway, Imperial Beach, Oceanside, City of San Diego	-
Commercial/Multifamily Unit	-	El Cajon, San Marcos, Lemon Grove, Carlsbad, Encinitas, Encinitas, Coronado, La Mesa, City of San Diego	San Marcos,	Chula Vista, Poway, Imperial Beach, Oceanside	Lemon Grove (zoning clearance), Oceanside (permit type issuance is case by case)
Open Parking Lot	-	El Cajon, San Marcos, Lemon Grove, Carlsbad, Encinitas, Encinitas, Coronado, Imperial Beach, City of San Diego	San Marcos	Chula Vista, Poway, La Mesa, Oceanside	Lemon Grove (zoning clearance), Coronado (engineering department because of right of way)
On-street Parking	-	El Cajon, San Marcos, Lemon Grove, Encinitas, Encinitas, Coronado, Imperial Beach	San Marcos	Chula Vista, La Mesa	Lemon Grove (encroachment removal agreement), Encinitas (encroachment), Poway (not allowed), Coronado (engineering department because of right of way), Imperial Beach (encroachment)

*Jurisdictions may have more than one type of permit for residential and public/commercial EVSE installations.

Inspections

Inspections Required for EVSE Installations

Type of Installation	Inspections Required					
	Plan Check Only	Pre-Inspection	Post-Inspection	Pre- & Post-Inspection	1+ Pre- & Post-Inspection	Intermediate & Post-Inspection
Single-Family Residence	-	-	El Cajon, San Marco, Chula Vista, Lemon Grove, Encinitas, Encinitas, Coronado, La Mesa	Oceanside	-	Carlsbad, Imperial Beach, City of San Diego
Commercial/Multifamily Unit	-	-	El Cajon, San Marcos, Chula Vista, Lemon Grove, Encinitas, Coronado	Oceanside	-	Chula Vista, Carlsbad, La Mesa, Imperial Beach
Open Parking Lot	-	-	El Cajon, San Marcos, Chula Vista, Lemon Grove, Encinitas, Coronado	Oceanside	-	Carlsbad, La Mesa, Imperial Beach
On-street Parking	-	-	El Cajon, San Marcos, Chula Vista, Lemon Grove, Coronado	Oceanside	-	Encinitas, La Mesa, Imperial Beach

How Applicants Can Request an Inspection Date & Time for EVSE Installations*

How to Request an Inspection	Jurisdiction
Online	Chula Vista, Coronado, Oceanside
Over the phone	El Cajon, San Marcos, Chula Vista, Lemon Grove, Carlsbad, Encinitas, Poway, Coronado, La Mesa, Imperial Beach, Oceanside and the City of San Diego.
In the office	El Cajon, Chula Vista, Lemon Grove, Encinitas, Poway, Coronado, Imperial Beach, Oceanside
By mail	-
Other	-

*Jurisdictions may have more than one method for requesting an inspection of EVSE installations.

How Many Business Days to Provide an Inspection After it is Requested

Days to Provide an Inspection	Jurisdiction
Same day	El Cajon, Poway
2-5 days	Lemon Grove, Carlsbad, Encinitas, Encinitas, Coronado, La Mesa, Imperial Beach, Oceanside, City of San Diego
6-10 days	-
3-5 weeks	-
More than 5 weeks	-
TBD (based on inspection/ranges)	San Marcos, Chula Vista

*Jurisdictions may have more than one method for requesting an inspection of EVSE installations.

Inspector Checklist for EVSE Installations by Jurisdiction

Do you have an inspector checklist for EVSE installation?	Jurisdiction
Yes	El Cajon, Coronado
No	San Marcos, Chula Vista, Lemon Grove, Carlsbad, Encinitas, Encinitas, Poway, La Mesa, Imperial Beach, Oceanside, City of San Diego

It is important to note that the **City of Oceanside** has created a general installation guideline for residential EVSE installations, including inspection recommendations, but not a specific inspector checklist for the installation of PEV infrastructure. The **City of San Diego** also was not sure if an inspector checklist was available to the city's inspectors. The **City of San Diego's** response was recorded as a "No".

Building Codes

Many regions across California and Canada have implemented building codes that establish the make it easier to install EVSE in an effort to promote the deployment of PEVs and charging infrastructure. For the most part, these regions have focused on "pre-wiring" buildings for EVSE infrastructure. The following section provides a brief description of policies and measures that other regions have implemented in regards to building codes.

Best Practices

The City of Los Angeles Green Building Code has been recognized as a best practice for promoting EVSE-friendly policies, and this is no exception when discussing the EVSE building code requirements in L.A.'s municipal code. Also in Southern California, the City of Santa Monica has adopted requirements for electrical services meant for charging PEVs in new buildings or structures. The California Green Building Standards Code (CalGreen) has created mandatory measures for nonresidential structures that require local municipalities to adopt specific parking measures for low-emitting, fuel-efficient and carpool/van pool vehicles which include PEVs.

CalGreen also includes voluntary building code measures that are specific to EVSE requirements. In Northern California, the County of Sonoma has used California Building Code (Title 24) as a template to adopt A.D.A. requirements for EVSE. Internationally, the City of Vancouver, British Columbia has revised the City's building bylaw to accommodate PEVs in new apartment buildings and other multi-family buildings.

Electric Vehicle Supply Wiring ("Pre-wiring Requirements")

The City of Los Angeles
L.A. Green Building Code: 99.04.106.6:[1] Effective as of January 1, 2011 which includes:
Non-Residential: Provide a minimum number of 208/240 V 40 amp, grounded AC outlet(s), that is equal to 5% of the total number of parking spaces. The outlet(s) shall be located in the parking area.
Single Family Dwellings: 1 per unit.
Multi-Family Unit Dwellings: 5% of parking capacity.

California Green Building Standards Code[2]
Cal Green Nonresidential Voluntary Measures
The measures here are not mandatory unless adopted by a jurisdiction, but provides measures that designers, builders and property owners may follow during design and construction.

A5.106.5.3 Electric Vehicle Charging: Provide facilities meeting Section 406.7 (Electric Vehicle) of the California Building Code and as follows:
A5.106.5.3.1 Electric vehicle supply wiring

1) For each space, provide one 120 VAC 20 amp and one 208/240 V 40 amp, grounded AC outlets or panel capacity and conduit installed for future outlets for up to 10% of total designated parking spaces for low-emitting and fuel efficient vehicles, which includes PEVs.

City of Vancouver, British Columbia, Canada
13.2.1. Electric Vehicle Charging
13.2.1.2. Electrical Room

1) The electrical room in a multi-family building, or in the multi-family component of a mixed use building, that in either case includes three or more dwelling units, must include sufficient space for the future installation of electric equipment necessary to provide a receptacle to accommodate use by electric charging equipment for 100% of the parking stalls that are for use by owners or occupiers of the building or of the residential component of the building

City of Vancouver, British Columbia, Canada
Office of Sustainability, Planning, Development Services and Engineering Services[3]
Green Homes Program[4]
The Vancouver City Council adopted the Green Homes Program which included a requirement within the building by-law to require provisions to accelerate EV charging infrastructure in all new single family dwellings. Specifically, the Green Homes Program states that a cable raceway be installed in new homes that runs from the building's electricity panel directly to the garage, to an empty outlet box.

Note: See the full recommendation from the City's Chief Building Office for the "Infrastructure Installation for Plug-in Electric Vehicles for New Dwellings"

EVSE and Designated Parking Requirements

The City of Santa Monica
9.04.10.08.050 Number of bicycle, vanpool and carpool parking spaces required. [5]

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[1] http://ladbs.org/LADBSWeb/LADBS_Forms/Publications/LAGreenBuildingCodeOrdinance.pdf
[2] http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf
[3] http://vancouver.ca/files/cov/green-homes-council-report.pdf
[4] http://vancouver.ca/home-property-development/green-home-building-policies.aspx
[5] http://www.qcode.us/codes/santamonica/view.php?topic=9-9_04-9_04_10-9_04_10_08-9_04_10_08_050&frames=on

New buildings or structures over fifteen thousand square feet shall provide bicycle parking at a rate of five percent of the automobile parking required pursuant to Section 9.04.10.08.040[6] (Number of parking spaces required) and shall provide a minimum of one electrical outlet which shall be accessible to the parking area for the purpose of recharging electric vehicles.

City of Vancouver: Infrastructure Installation for Plug-in Electric Vehicles

Policy Report from the Office of Sustainability, Planning, Development Services and Engineering Services to the City of Vancouver Standing Committee on Planning and Environment advocating the Green Homes Program. A subsection of this program includes a recommendation in the building by-law for EVSE "pre-wiring" requirements for all new single family homes.

Over the past 5 years there has been a growing market for electric bicycles and scooters. It is also expected that plug-in electric hybrid vehicles will be available to the public in the near future, followed soon after by the widespread availability of fully electric vehicles. The adoption of this technology represents a significant opportunity to further reduce GHG's in the Vancouver community. However, a primary challenge to their adoption is the fact that they require a charging station in the user's home. To that end, staff is recommending requiring the installation of a cable raceway from the building's electricity circuit panel to an enclosed outlet box in the home's garage or carport. In doing so, staff is ensuring that the home can be easily retrofitted at a later date to allow for the installation of electric vehicle charging facilities. This recommendation recognizes that infrastructure must be put in place at the time of construction in order to ease the adoption of emerging technologies by the homeowner at a later date.

L.A. Green Building Code Standards for Non-Residential and Residential EVSE Building Code Requirements

Mandatory measure for newly constructed low-rise residential building: *Electric Vehicle Supply Wiring 99.04.106.6.*

1) For one-or two- family dwellings and townhouses, provide a minimum of:
    a. One 208/240 V 40 amp, grounded AC outlet, for each dwelling unit; or
    b. Panel capacity and conduit for future installation of a 208/240 V 40 amp, grounded AC outlet, for each dwelling unit
2) Residential occupancies where there is a common parking area, provide:
    a. Provide a minimum number of 208/240 V 40 amp, grounded AC outlet(s), that is equal to 5% of the total number of parking spaces. The outlet(s) shall be located in the parking area; or
    b. Panel capacity and conduit for future installation of electrical outlets. The panel capacity and conduit size shall be designed to accommodate the future installation, and allow the simultaneous charging, or a minimum number of 208/240 V 40 amp, grounded AC outlets, that is equal to 5% of the total number of parking spaces. The conduit shall terminate within the parking area; or
    c. Additional service capacity, space for future meters, and conduit for future installation of electrical outlets. The service capacity and conduit size shall be designed to accommodate the future installation, and allow the simultaneous charging, or a minimum number of 208/240 V 40 amp, grounded AC outlets, that is equal to 5% of the total number of parking spaces. The conduit shall terminate within the parking area

Mandatory measure for newly constructed non-residential and high-rise residential building: *Electric Vehicle Supply Wiring 99.05.106.5.2*

1) Provide a minimum number of 208/240 V 40 amp, grounded AC outlet(s), that is equal to 5% of the total number of parking spaces. The outlet(s) shall be located in the parking area

[6] http://www.qcode.us/codes/santamonica/view.php?cite=section_9.04.10.08.040&confidence=6

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) INSPECTION CHECKLIST

Key Concerns for Electric Vehicle Supply Equipment Inspections

1. Is the appropriate permit secured and is there a plan and calculation as required by the AHJ?
2. What type of electric vehicle supply equipment (EVSE) is being installed (i.e. Level 1, Level 2, other)?
3. Where is the EVSE located in relation to the charging location and the service or supply source?
4. Is the EVSE listed by an NRTL and are the installation instructions available for reference?
5. Is the EVSE going to be cord-and-plug connected (and so listed) or direct wired to an individual branch circuit?
6. What amount of voltage and current is required for the type of EVSE (nameplate information)?
7. Is the EVSE securely mounted to the structure and individual branch circuit wiring installed per NEC?
8. Is the properly sized equipment grounding conductor connected and proper overcurrent protection provided?
9. Does the service or source have adequate capacity for the load served?
10. Are separate utility meter(s) and/or service disconnecting means installed for special utility rates?

INSPECTION CHECKLIST (non-inclusive)

EVSE Inspection Activity Details

	Item	Inspection Activity	Code Reference	Comments
	1.	Verify permit is posted and all plans, calculations and installation instructions are available as required. May require use of examples in NEC Chapter 9. A calculation may be required to determine adequate capacity.	Local Regulations and NEC 90.8, 220.12, 220.14, 220.16, 220.82	
	2.	Verify that the EVSE is listed by an NRTL and installation instructions are provided.	NEC 90.7, 625.5, 110.3(B)	
	3.	Verify the EVSE location and that it is securely fastened to the structure and guarded from physical damage as required.	NEC 110.13, 110.27(B), 625.29, 625.30	
	4.	Determine if EVSE is directly wired to the branch circuit or is cord-and-plug connected. Must be listed for cord-and-plug connection. Individual receptacle reqd.	NEC 110.3(B), 625.13, 625.18, 625.19, 625.29	
	5.	Verify an individual branch circuit is installed for the EVSE. Applies to Level 1, Level, 2, and fast chargers. Branch circuit and feeders (if applicable) must be sized 125% of nameplate current.	NEC Article 100 continuous load, 210.19(A)(1), 215.2(A), 625.21	
	6.	Verify installed branch circuit wiring method is listed and securely fastened to the structure. Listed wiring and fittings must be installed. Check fished and surface wiring.	NEC 300.11 and the applicable .30 section of article	
	7.	Verify the size of the branch circuit overcurrent protection is per nameplate and protects the conductors.	NEC 110.3(B), 240.4	
	8.	Verify circuit conductors are sized not less than 125% of EVSE nameplate current. Be sure that the conductor ampacity complies with the rating of the overcurrent protection.	NEC 210.19(A)(1), 215.2(A), 110.3(B), Table310.15(B)(16), 310.15(B).	
	9.	Verify properly sized equipment grounding conductor is installed with the branch circuit and connected at the EVSE and to panelboard or service. Verify the equipment grounding conductor is identified.	NEC 250.110, 250.112, 250.114, 250.120, 300.3(B), 250.119, 250.122.	

	10.	Check the electrical connections of the circuit conductors and equipment grounding conductor connections.	NEC 110.14, 250.148(A) Annex I	
	11.	Verify disconnecting means is provided and properly located for EVSE rated greater than 60 amperes and 150 volts.	NEC 625.23	
	12.	Verify installation of EVSE is in a neat and workmanlike manner.	NEC 110.12, NECA 1, NECA 413	
	13.	Verify existing service conductors are of adequate size. For Level 2 EVSE installations, identify any existing service conductor sizes that might have been installed using NEC 310.15(B)(7) and Table 310.15(B)(7)	NEC 230.31, 230.42, 310.15(B)(7) and Table 310.15(B)(7)	
	14.	Verify circuit breaker compatibility with existing panelboard or service equipment. Must be manufactured by the panelboard or service equipment manufacturer.	NEC 110.3(B), Article 240 Part VII, Article 408 part I	
	15.	Branch circuit device and any disconnects must be identified as to the use.	NEC 408.4(A), 110.22(A)	
	16.	Where separate utility metering and enclosures are installed, verify NEC compliance for service equipment and conformance to applicable utility regulations.	Utility company regulations and NEC Article 230	
	17.	Verify equipment is suitable for connection to the line side of the service disconnecting means.	NEC 230.82	
	18.	Verify sufficient working space is provided at EVSE, Panelboards, service equipment, and disconnects.	NEC 110.26	
	19.	Verify additional service disconnects (if installed) are grouped.	NEC 230.72	
	20.	Verify the maximum number of service disconnects has not been exceeded	NEC 230.71	
	21.	Verify that any additional service disconnect is properly rated.	NEC 230.79	
	22.	Verify the wiring method used for the additional service conductors installed.	NEC 230.43	
	23.	Verify that additional service disconnects are properly identified.	NEC 230.70(B)	
	24.	Verify service disconnect is listed as suitable for use as service equipment.	NEC 230.70(C)	
	25.	Verify the overcurrent protection for any newly installed service equipment and conductors.	NEC 230.90, 230.91	
	26.	Verify grounded conductor (neutral) is brought to the service disconnect and bonded to the enclosure.	NEC 250.24(C)	
	27.	Verify metal service equipment enclosures and raceways are bonded together effectively.	NEC 250.92, 250.92(B)	
	28.	Supply-side bonding jumpers are sized properly	NEC 250.102(C), 250.66	
	29.	Verify existing service grounding and bonding.	NEC 250.50, 250.104(A) and (B)	
	30.	Verify EVSE that is intended to be used as interactive systems, bi-directional, or optional standby systems be listed for that purpose.	NECA Articles 702 and 705	

** Note: These items included in the checklist are non-inclusive and are to serve as a guide or basis for inspection. They do not include any local Code requirements or regulations.*

Outreach to Local Businesses and Residents

In an effort to increase the PEV and EVSE education in the San Diego region, a number of resources are currently available to area residents and businesses. The majority of these resources are online and local municipalities should leverage these resources to make further available for their citizens and businesses. This section is divided into outreach materials and program contact information for both residents and local businesses.

Best Practices

Residents

San Diego Gas & Electric (SDG&E)

New PEV drivers in the region will need guidance on what options are available for home EV charging stations, the appropriate PEV-specific rate to choose and information on public charging locations.

SDG&E Residential EV Customers. http://www.sdge.com/clean-energy/residential/getting-started

Taking Charge I: First Step to PEV Readiness in the San Diego Region[1]

This resource will help area residents walk through the steps to help them decide the appropriate level of charging for their PEV. This resource should be distributed to homeowners in your area. A full copy of this document is located towards the end of the report.

Businesses

SDG&E

In the SDG&E service area, business owners and owners of multi-unit housing developments can get advice on bringing electric vehicle infrastructure to their businesses or housing developments.

SDG&E Employers and Property Owners: http://www.sdge.com/employers-and-property-owners

EVSE Installations in Multi-unit Dwellings

Between 2010 and 2012, SDG&E has held nine quarterly seminars focused on issues involved with vehicle charging at multi-unit dwellings (MUD). The MUD workshops have educated property managers, owners, HOAs, residents and contractors on the spectrum of available vehicles and EVSE technology and methods and strategies to work with the multiple stakeholders involved in the installation of EVSE at MUDs.

- To Register for MUD Charging Course: https://seminars.sdge.com/
- Key Contact: Joel Pointon, Manager of Electric Transportation for SDG&E
    - Email: JPointon@SempraUtilities.com
    - Phone: 858-654-8767

Understanding Workplace Charging

SDG&E also has offered seminars focused on educating employers throughout the region regarding workplace charging. In addition to discussing available technologies, these workshops provide more details regarding utility rates, such as time-of-use rates and demand charges, and how these rates affect an employer's electricity bill. The workshops also discuss employee equity issues, parking management and pay-for-use options.

- To Register for MUD Charging Course: https://seminars.sdge.com/

[1] Adapted from Take Charge I: A First Step to PEV Readiness in the Sacramento Region, a report from SACOG and the Capital Area PEV Coordinating Council.

- Key Contact: Matt J. Zerega, Project Manager of Product Innovations
    - Email: MZerega@semprautilities.com
    - Phone: 858-654-8374