Electric Vehicle Charging Station Permitting and Inspection Best Practices:

A Guide for San Diego Region Local Governments

June 2016

Submitted by
Center for Sustainable Energy

SANDAG Center for Sustainable Energy

Summary of Acronyms

AHJ: authority having jurisdiction

BEV: battery electric vehicle

CSE: Center for Sustainable Energy

EVSE: electric vehicle supply equipment

EVCS: electric vehicle charging station

GHG: greenhouse gas

NRTL: Nationally Recognized Testing Laboratory

PEV: plug-in electric vehicle

PHEV: plug-in hybrid electric vehicle

SANDAG: San Diego Association of Governments

SAE: Society of Automotive Engineers

ZEV: zero-emission vehicle

Executive Summary

As adoption of plug-in electric vehicles (PEVs) grows in the San Diego region and statewide, there is a greater demand for residential, workplace and commercial electric vehicle charging stations (EVCS). Although the region has made great strides in facilitating the adoption of vehicles and infrastructure, more work is necessary. Through funding from the California Energy Commission, the San Diego Association of Governments (SANDAG) and the Center for Sustainable Energy (CSE) have partnered to implement the EVCS best practice recommendations from the 2014 San Diego Regional PEV Readiness Plan (Readiness Plan) that was developed through the San Diego Regional Electric Vehicle Infrastructure (REVI) Working Group.[i] This implementation program is known as **Plug-in SD**.

In July 2015, SANDAG and CSE launched Plug-in SD to promote regionally consistent and streamlined residential and commercial EVCS permitting, inspection and installation best practice resources for local governments and installers. This report serves as one of these resources and includes:

- An overview of common barriers to EVCS installations including permit application delays and inspection corrections identified in the Readiness Plan
- A catalogue of existing permit processes and compliance requirements for EVCS among building departments in the San Diego region
- EVCS permitting and inspection best practices that assist local building departments in preparing for the anticipated increase in EVCS permits

EVCS permitting best practices presented in this report derive from those currently in place throughout San Diego region local governments, the Readiness Plan and the Governor's Office of Planning and Research *Zero-Emission Vehicles in California: Community Readiness Guidebook* (ZEV Guidebook).[ii] These best practices include:

- Clear and regionally consistent website information
- EVCS permitting guide
- EVCS-specific and fillable permit application
- Permit fee incentives
- Plan review and inspection corrections lists
- Online permitting and inspection services

Plug-in SD provides technical assistance to municipalities to facilitate the adoption and implementation of this project's best practices and resources. Consultations with technical staff, or "EV experts," are available via in-person or remote (email and phone) meetings. EV experts can be contacted by email at evexpert@energycenter.org or by phone at (866) 967-5816. As developed, resources and information will be hosted at http://energycenter.org/pluginsd.

I. Introduction

As adoption of plug-in electric vehicles (PEVs) grows in the San Diego region and statewide, there is a greater demand for residential, workplace and commercial electric vehicle charging stations (EVCS), also known as electric vehicle supply equipment (EVSE). More than 150,000 PEVs[iii] have been deployed statewide, and nearly 13,000 of those vehicle owners reside in San Diego County (rebate data from the Clean Vehicle Rebate Project[iv] is displayed in Appendix A). Charging infrastructure not only needs to be installed for existing electric vehicles, but also to accommodate up to 1 million zero-emission vehicles (ZEVs) by 2020 and 1.5 million ZEVs on California roadways by 2025 per Governor Brown's Executive Order.[v] In order to accommodate the expected increase of PEVs, the Executive Order requires that the state's major metropolitan areas, including the San Diego region, have adequate infrastructure plans to be "ZEV-ready" by 2015. According to the Alternative Fuels Data Center, the San Diego region currently has 687 charging stations open to the public.[vi] The state estimates the San Diego region needs to deploy approximately 75,000 residential charging ports and 12,000 workplace charging ports to support expected regional PEV growth.[vii] EVCS installers and local governments play a key role in PEV adoption and deployment of charging infrastructure.

The state estimates the San Diego region needs to deploy approximately 75,000 residential charging ports and 12,000 workplace charging ports to support expected regional PEV growth.

The following sections provide a brief background on EVCS technology, common EVCS installation barriers and an overview of the existing permit submittal processes and are followed by details about the best practice recommendations.

II. Electric Vehicle Charging Technology

The majority of PEVs include a 120-volt charging cord that enables drivers to charge their vehicle with a conventional three-prong outlet. This is classified as Level 1 charging. Level 2 charging stations use 240 volts and offer two to three times the charging speed compared with 120-volt charging. Level 2 charging stations are commonly installed in residential as well as commercial settings. DC fast charging has high power requirements only suited to commercial settings; not all PEVs are capable of DC fast charging. Table 1 displays the three levels of PEV charging with associated specifications and details.

Table 1: Levels of Charging and Miles of Range[viii]

Type of Charging	Power Levels (installed circuit rating)	Miles of Range per Hour of Charge*	Where to Charge
Level 1	110/120VAC at 15 or 20 Amps	~4-6 miles/hour	At home or workplace
Level 2 **3.3kW (low)** **6.6kW (medium)** **9.6kW (high)** **19.2kW (highest)**	 208/240 VAC at 20-30 Amps 208/240 VAC at 40 Amps 208/240 VAC at 50 Amps 208/240 VAC at 100 Amps	 8-12 miles/hour 16-24 miles/hour 32-48 miles/hour >60 miles/hour	 At home, workplace or public charging station
DC Fast Charging	208, 440 or 480 VAC	~80% in <30 minutes	Public or commercial

***Refer to vehicle specifications for exact ratings.**

III. Common EVCS Installation Barriers

During previous PEV readiness planning efforts, REVI identified several common EVCS installation barriers. These barriers are summarized in Table 2. The best practices discussed in Section V of this report address the identified permitting and EVCS host education gaps.

Table 2: Regional Barriers to PEV Infrastructure

Barrier	Description
Permitting/Inspection	Lack of streamlined permitting and inspection processes and inconsistent (high) costs across jurisdictions.
Building Codes	Lack of standard building codes that accommodate charging infrastructure or dedicate circuits for charging infrastructure in new construction and major renovations.
Zoning and Parking Rules	Lack of standard regional ordinances that facilitate the installation and access to publicly available charging infrastructure.
Training and Education for Municipal Staff and Electrical Contractors	Lack of knowledge about PEVs and EVCS in general.
Consumer Awareness of PEV and EVCS Availability	Consumer lack of understanding of the electric vehicle types and EVCS equipment availability.
EVCS at Multi-Unit Dwellings	Building managers, building owners and homeowner associations lack of understanding of unique challenges associated with EVCS installations at multi-unit dwellings.
Commercial and Workplace Charging	Businesses lack of understanding regarding benefits of and approaches to implementing successful workplace charging programs.

IV. Existing Permit Submittal Processes

All 19 jurisdictions in the San Diego region require that an EVCS project be permitted by the building department prior to installation. Variations of submittal documents are identified in Table 3. Prior to permit issuance, applicants are to coordinate with a certified electrician and the local utility provider (San Diego Gas & Electric) to determine if there is sufficient electrical capacity for the EVCS. If there is limited electrical capacity, panel or transformer upgrades are necessary for the proposed site.

Table 3: Typical EVCS Permitting Documents[ix]

Documentation*	Description
Permit Application	Electrical permit or special permit for EV chargers (to be identified by jurisdiction).
EVCS Manufacturer's Information	The manufacturer's installation instructions and EV charger specifications.
Site Plan	Identify the complete layout of existing parking space(s) and proposed location of EVCS parking space(s) with respect to existing building and structures.
Electrical Load Calculations	Home electrical load calculation that estimates if an existing electrical service will handle the extra load from a residential EVCS and wiring methods based on the California Electrical Code (CEC). Note that CEC Article 220 requires load calculations if the existing service panel is rated less than 200 amps.
Electrical Plans	Single-line diagrams showing the system and point of connection to the power supply and the EVCS.

***Documentation will be specific to each jurisdiction.**

Cost, complexity and timing variables in the permitting process differ among the jurisdictions based on available staff and resources. Without regionally established standards, building departments adopt their own fee structures and compliance timelines. Fees for EVCS permits were found to range from $70 to $250. Inconsistent fees cause variance across the region as applicants and contractors estimate EVCS installation costs.

Residential EVCS

As mentioned in OPR's ZEV Guidebook, the largest volume of PEV charging is performed by single-family homeowners.[x] The permitting process for single-family residential charging can be the most straightforward process for EVCS permitting. Generally, "no-plan" permits are obtained for single-family residential applications and these permits can be applied for and issued over the counter. Over-the-counter approvals significantly expedite the permitting process. An electrical or building permit application is most common for a residential charging station (attached and detached homes) and submittal requirements typically include:

1. Building permit application (specific to jurisdiction)
2. Electrical service load calculations
3. Manufacturer's installation literature and specifications
4. Plot plan (specific to jurisdiction)

Few jurisdictions provide informational guidelines to assist permit applicants, and the majority of this information can be obtained only at the permit counter, requiring dedicated staff time. Providing permit requirements and procedures to potential applicants via other avenues (i.e., jurisdiction website) reduces demands on permitting staff. Some jurisdictions have developed guidelines for applicants, including the cities of Oceanside, San Diego, Chula Vista and National City.

To streamline the residential EVCS permitting process, the City of Oceanside has developed a load calculation worksheet, permit submittal requirements and installation guidelines for residential projects.

The City of Oceanside has developed documents that streamline the EVCS permitting process and guide a homeowner or contractor through the installation and permit process. The Residential Electric Vehicle Charger Guidelines[xi] allow users to complete a basic service load calculation, attach EVCS specification documents from the manufacturer and submit these items over the counter at the building department for permit review and issuance. The guidelines also provide conduit size requirements and general installation guidelines specific to residential projects. This document is available for download on the City of Oceanside's website.

Further, the cities of San Diego, Chula Vista and National City provide specific requirements to prospective EVCS applicants in the form of permit guidelines. These resources are discussed in the nonresidential EVCS section below.

Nonresidential EVCS

Nonresidential EVCS permitting projects encompass retail, commercial, public, workplace and, in certain cases, multi-unit dwellings. These projects involve more complex processes and requirements than most single-family residential installations. In addition to the requirements listed for single-family residential EVCS, parking and community design criteria are important components that need to be considered in non-residential settings. In most cases, commercial EVCS applications require additional submittal documentation and plan review. Generally, the permit applicant will need to complete the documents listed and pay the necessary plan check fees when submitting the permit package to the jurisdiction.

1. Building permit application (jurisdiction specific)
2. Electrical service load calculations and wiring methods based on the current California Electrical Code (Title 24, Part 3)

3. Electrical plan with single-line drawings showing how the EVCS will be powered and connection points to the electrical panel
4. Manufacturer's installation literature and specifications (for the charger being installed)
5. Site plan showing the location of the EVCS spaces in relation to existing buildings and structures, existing parking spaces and accessibility requirements

Accessibility requirements pose an additional consideration when dealing with nonresidential EVCS and permitting. The City of San Diego's Development Services Department created Technical Policy 11B-1[xii] in April 2012 to address accessibility to EVCS in both new and existing construction. The policy requires EVCS installations in public areas to be made accessible to persons with disabilities. Various jurisdictions throughout the San Diego region utilize the policy as a valuable reference for EVCS accessibility standards. Technical Policy 11B-1 emphasizes specifications for disabled accessible EV charging stations that are consistent with the 2010 California Building Code, Title 24, Part 2, Chapter 11B[xiii] requirements for accessible parking, public accommodations and services. (NOTE: The City of San Diego is revising Technical Policy 11B-1 to conform to the California Building Standards Commission (CBSC) approved amendments for the 2016 California Building Standards Code, Title 24, Part 2, Chapter 11B [xiv] requirements proposed by the Division of the State Architect (DSA). These approved terms go into effect January 1, 2017.) These specifications include the number of accessible EVCS required as well as the stall dimensions, signage, striping and disabled access to the EVCS.

The City of San Diego has developed a guidance document, Technical Policy 11B-1, to assist public agencies in standardizing accessibility and PEV parking policies.

All permit application documentation needs to be reviewed and approved by multiple city divisions such as planning, engineering, fire and others. As an example, the City of Chula Vista's Electric Vehicle Supply Equipment (EVSE) Permit Guide[xv] details the required approvals from divisions that will review the plans and provides contact numbers for staff. Additionally, the guide clearly defines the plan check fees for both residential and nonresidential EVCS applications. The guide also includes required information on the plans and the number of plan sets the City will need upon submittal, as well as supplemental resources.

National City developed an Electric Vehicle Supply Equipment Permit Guide[xvi] to provide permit applicants with the necessary forms, fees and plan requirements for obtaining a building permit for EVCS installation. The guide specifies the division reviews and approvals required for both EVCS residential and commercial permits. National City provides a review timeframe and links to beneficial PEV resources for applicant reference. Additionally, the guide includes accessibility considerations and instructions on how to set up an inspection for EVCS.

EVCS Building Inspections

After obtaining the required permit and completing the installation, the contractor or building owner must schedule a building inspection to verify safe and proper installation. Building inspectors perform physical inspections of the system, ensuring that the installation meets life-safety and electrical code standards. If the project passes, the inspector initiates the permit closure process for the department's records and the building owner or homeowner is allowed to utilize the charging equipment.

All EVCS installations require an inspection in San Diego region jurisdictions. Inspection requests can typically be scheduled by phone, email or online through a jurisdiction's building department web portal depending on the jurisdiction. An inspection is generally completed within a week after the request is made. Building inspectors typically provide a window for scheduling inspections that range from one to three hours; the physical inspection for a simple residential EVCS installation can be completed in approximately 15 minutes. Non-residential inspections are generally more time consuming as more details, such as accessibility, must be checked. Additionally, rough and final inspections are often required.

V. Best Practice Recommendations

Efficient permitting and inspection practices for EVCS will aid the growth of infrastructure and, in turn, continue to encourage the adoption of PEVs throughout the San Diego region. This report offers several recommendations to streamline the permitting and inspection process. These best practices derive from the Readiness Plan and OPR's ZEV Guidebook as well as observations of the existing EVCS permit processes deployed by San Diego region building departments.

These best practices and other Plug-in SD resources aim to streamline the permit review, issuance and inspection process, so that local jurisdictions can reduce the time it takes to determine proper permit requirements, obtain an EVCS permit and complete the inspections.

Best Practice: Clear and Consistent Website Information

Building departments can use their websites to provide clear and consistent instructions on permitting processes. Providing clear steps and submittal requirements online can save valuable staff time and resources. While many building departments make general information available online, it is often not easily accessible (i.e., multiple "clicks" required to access information) or presented as a dense wall of text that is difficult for an inexperienced applicant to follow. User experience has a distinct impact on a web visitor's ability to absorb and act on the information provided.

Recommendations for effective website best practices include:

1. Clearly define permit application requirements for residential and nonresidential EVCS projects
2. Provide "one-click" links to permit applications

3. List EVCS permit requirements by project type and use and include easy-to-understand key words, such as “Electric Vehicle Charging”

Clear and consistent website language will be drafted as part of Plug-in SD and assistance will be available to customize the language for each jurisdiction.

Best Practice: Electric Vehicle Charging Station Guide or Checklist

Provide a guide to applicants prior to submittal that can help them navigate through the application and plan review process. This helps assure all necessary documentation is present at the time of application submittal and can lead to a speedy review. Applicants frequently submit incorrect or incomplete compliance documentation, which causes permit counter staff or plan reviewers to spend more time with applicants explaining the process.

As mentioned in Section IV, four out of 19 jurisdictions in the San Diego region provide guidelines specific to electric vehicle charging stations: City of Oceanside has guidelines specific to residential EVCS and the cities of National City, Chula Vista and San Diego have guidelines that address both residential and nonresidential EVCS.

Providing concise and well-defined submittal checklists for applicants and counter technicians prior to intake can expedite the permitting process. A checklist can reference code requirements and applicable code sections pertinent to EVCS and should indicate the application review and permit issuance timelines, submittal documentation and fee requirements and information about other division approvals (Structural, Mechanical, etc.) that may be required. The checklist can be designed for use by both building department staff and permit applicants and can include the following key features:

1. Review timelines: Authorities having jurisdiction (AHJs) may want to establish clear timelines as to who conducts each review and when. AHJs should specify departmental reviews and standardize review timeline for EVCS.
2. Fee standardization: Set or standardize permit fees for EVCS across the region.
3. Point of contact: Provide a point of contact for applicants to reach appropriate department staff to address comments and obtain approvals. The City of Vista exemplifies this best practice in their solar permitting process with a designated staff member as the point of contact for photovoltaic projects.

By including review timelines, a fee schedule, and a point of contact in the checklist, applicants will have a clear understanding of when they can expect corrections and who to reach out to if they have specific questions. The checklist can also serve as a resource to staff by referencing code sections applicable to electric vehicle charging station installations.The Readiness Plan includes a sample EVSE Inspection Checklist from a program by the National Electrical Contractors Association. The EVSE Inspection Checklist serves as a useful resource to building inspectors for EVCS installations (See Appendix B).

Best Practice: Electric Vehicle Charging Station-specific, fillable application

Not all building departments have the resources to implement online permit platforms that support electronic submittals. However, providing fillable PDF applications and compliance documents (when

applicable) on jurisdiction websites can decrease applicant wait times at the permit counter. Further, providing online PDFs that allow electronic signatures can potentially lead to alternate submittal processes, such as via email. Additionally, these fillable applications may assist with the internal tracking of application volume, as well as general tracking of EVCS installations in the jurisdiction.

Jurisdictions in the San Diego region also can consider adopting regionally consistent residential application requirements. A template produced by the U. S. Department of Energy serves as a tool that a group of jurisdictions can adopt and implement.[xvii] While more upfront coordination may be needed to make this occur, doing so would make it easier for contractors and applicants to follow requirements.

Best Practice: Permit Fee Incentives

Jurisdictions can consider adopting a fee incentive or waiver for EVCS installations, as some have done for solar photovoltaic installations. The City of Encinitas provides an "energy efficiency permit fee waiver" for residential EVCS applications. This reduces installation costs for applicants, incentivizes permit pulling and allows Encinitas to track EVCS installations in its community. .

Best Practice: Plan Review and Inspection Corrections Lists

When building department staff – permit reviewers and inspectors – use lists that identify common corrections and provide solutions to addressing these corrections, it greatly assists in expediting the overall plan check and inspection process. These tools have been developed as a resource by the Plug-in SD program (See Appendix C & D for Plug-in SD correction sheets).

Best Practice: Online Permitting and Inspection Services

Online permit services can optimize the permit application and plan review process by providing a digital method to submit applications, as well as capture and track reviewer comments and feedback. Reviewing commercial applications typically involves multiple reviewers from different divisions. Online permit platforms can also offer plan review features that improve both internal and applicant communication on the status of reviews.

The City of San Diego offers an example of this recommended best practice for residential EVCS permits. The city provides online permitting for residential EVCS through their SimplEPermit[xviii] system that can be used by homeowners, property owners and contractors. Rather than visiting the permitting desk, applicants can access online permitting 24 hours per day, seven days a week and pay fees online. Online permitting reduces backlogs at the permit counter and frees up time for counter staff to focus on more complex permit applications.

While most, if not all, building departments allow inspection scheduling via phone, for jurisdictions that currently have online permit services, online scheduling for EVCS inspections would also streamline the process. Additionally, online permit systems should provide applicants with a checklist or inspection procedure summary upon permit issuance. This summary should include building inspection information, timelines, procedures for requesting and receiving a building inspection and any documents that will be needed at time of inspection. For those jurisdictions that currently have online permitting capability, consider providing building inspectors with remote digital access to all documents

and drawings associated with the permit application via a laptop or tablet in order to alleviate documentation issues in the field.

Lastly, based on the complexity of the installation, building departments could consider requiring only one final inspection and/or avoiding project progress inspections for simple or common installations.

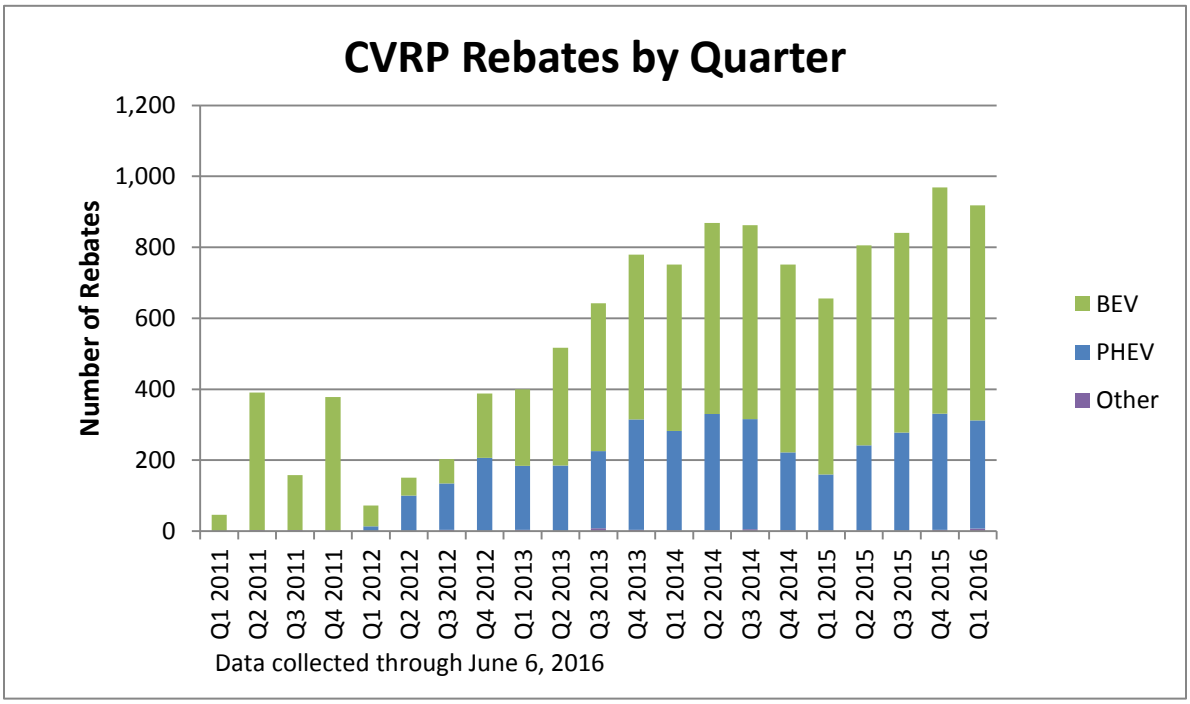
VI. Conclusion

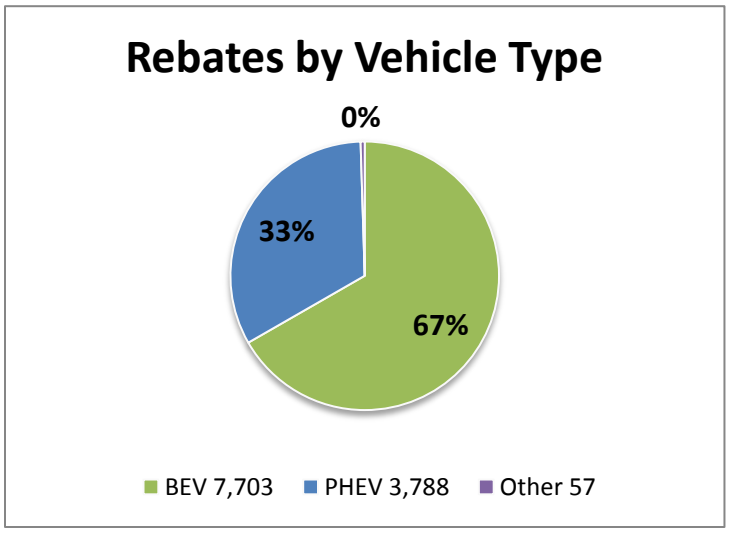
As the State of California seeks to achieve its ambitious energy and climate goals, it has called upon local jurisdictions to support the adoption of plug-in electric vehicles. There are many low or no cost ways jurisdictions can support State goals and EVCS deployment through improvements to their permitting and inspection processes.

Efficient permitting and inspection practices for EVCS will aid the growth of infrastructure and, in turn, continue to encourage the adoption of PEVs throughout the San Diego region. This report offers several recommendations to improve the existing permitting and inspection processes in the region. The Plug-in SD program will help to develop additional resources, including website language and permitting checklists that can be customized for use by jurisdictions.

In addition to this report, a separate Plug-in SD report, *Electric Vehicle Charging Station Installation Best Practices: A Guide for San Diego Region Local Governments and Contractors,* offers additional guidance on the installation process for EVCS. The Plug-in SD program provides technical assistance in the form of a readily accessible "EV Expert" to assist users with the use and interpretation of the two best practice reports. The "EV Expert" serves as a one-stop shop for jurisdictions looking for more resources to support permitting, installation and generally encourage EVCS deployment. Through sustained effort, the region can foster widespread and accessible PEV infrastructure that meets the needs of current and future PEV drivers.

Appendix A: CVRP Electric Vehicle Statistics in San Diego[1]





BEV	Highway-capable, four-wheeled, all-battery electric vehicle
PHEV	Plug-in hybrid electric vehicle (electricity and gasoline)
Other	Non-highway, motorcycle and commercial BEVs

Total rebates through Q1 2016 as of June 6, 2016: 11,548

[1] Center for Sustainable Energy (2016). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last updated June 6, 2016. Retrieved June 16, 2016 from https://cleanvehiclerebate.org/eng/rebate-statistics

Appendix B: EVSE Inspection Checklist

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.*

Permit Number (for use by jurisdiction staff):_____

Appendix C: Permit Application and Plan Review Correction Sheets

Permit Application Correction Sheet for Residential Electric Vehicle Charging Station

INSTRUCTIONS: This Correction Sheet shall be used during a residential Electric Vehicle Charging Station (EVCS) installation permit application and plan review. If any discrepancies are found on the application and/or supplemental documentation, record the details of needed corrections on this Correction Sheet and provide to the applicant. Highlight or cite Correction Sheet section and item number in correction summary.

Check One	Type of Charging Station(s) Proposed	Power Levels (proposed circuit rating)
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps
☐	Level 2 - 3.3 kilowatt (kW) (low)	208/240 VAC at 20 or 30 Amps
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps
☐	Other (provide detail)	

Section 1: PERMIT APPLICATION

1) Is the permit application complete with the following information: Project address, parcel #, builder/owner name, contractor name, valid contractor license #, phone numbers and any other requirement? Yes ☐ No ☐
2) Does the application include electric vehicle charging station manufacturer's specs and installation guidelines? Yes ☐ No ☐

Section 2: ELECTRICAL LOAD CALCULATION WORKSHEET

1) Is an electrical load calculation worksheet included? (CEC[2] 220) Yes ☐ No ☐
2) Based on the load calculation worksheet, is a new electrical service panel upgrade required[3]? Yes ☐ No ☐
    a. If yes to Q2, do plans include the electrical service panel upgrade? Yes ☐ No ☐
    b. If yes to Q2, is the SDG&E work order included with permit application? Yes ☐ No ☐
3) I the charging circuit appropriately sized for a continuous load (125%)? Yes ☐ No ☐
4) If charging equipment proposed is a Level 2 - 9.6kW station with a circuit rating of 50 amps or higher, is a completed circuit card with electrical calculations included with the single-line diagram? Yes ☐ No ☐ Not Applicable ☐

Section 3: SITE PLAN & SINGLE LINE DRAWING

1) Is a site plan and electrical plan with a single-line diagram included with the permit application? Yes ☐ No ☐
    a. If mechanical ventilation requirements are triggered for indoor venting requirements (CEC 625.29 (D)), is a mechanical plan included with the permit application? Yes ☐ No ☐
2) Is the site plan fully dimensioned and drawn to scale? Yes ☐ No ☐
    a. Showing location, size, and use of all structures? Yes ☐ No ☐
    b. Showing location of electrical panel to charging system? Yes ☐ No ☐
    c. Showing type of charging system and mounting? Yes ☐ No ☐
    d. Is the type of mounting for charging system included if the charging system is not wall-mounted? Yes ☐ No ☐ Not Applicable ☐

Section 4: COMPLIANCE WITH 2013 CALIFORNIA ELECTRCIAL CODE (TITLE 24, PART 3)

1) Does the plan include EVCS manufacturer's specs and installation guidelines? Yes ☐ No ☐
2) Does the electrical plan identify the amperage and location of existing electrical service panel? Yes ☐ No ☐
    a. If yes to Q2, does the existing panel schedule show room for additional breakers? Yes ☐ No ☐
    b. Are sizes for the conduit and conductor included? Yes ☐ No ☐
3) Is the charging unit rated more than 60 amps or more than 150V to ground? Yes ☐ No ☐

[2] 2013 California Electrical Code. Article 220 Branch-Circuit, Feeder, and Service Calculations

[3] **Load Calculation Worksheet review instructions:** The size of the existing service MUST be equal to or larger than the Minimum Required Size of main service breaker. If the existing service panel is **smaller** than the minimum required size of existing electrical services, then **a new upgraded electrical service panel must be installed** in order to handle the added electrical load from the proposed EVCS.

   a. If yes to Q3, are disconnecting means provided in a readily accessible location in line of site and within 50' of EVCS? (CEC 625.23) Yes ☐ No ☐

4) Does the charging equipment have a Nationally Recognized Testing Laboratory (NRTL) approved listing mark? (UL 2202/UL 2200) Yes ☐ No ☐
5) If trenching is required, is the trenching detail called out? Yes ☐ No ☐
   a. Is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐
   b. Is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Section 5: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE FOR NEW CONSTRUCTION

2013 CALGreen Mandatory EVCS Requirements for New Construction[4]

1) Do CALGreen EV Readiness installation requirements apply to this project? Yes ☐ No ☐
   a. Should be identified during plan review. (4.106.4.1 &4.106.4.1.1)
   b. 2016 CALGreen proposed mandatory EVCS requirements for new construction (If approved, effective January 1, 2017)

CORRECTION(S) SUMMARY:

_____
_____
_____

[4] 2013 California Green Buildings Standards Code. Title 24, Part 11, Section 4.106.4.1 &4.106.4.1.1 *One-and two family dwellings*

Permit Number (for use by jurisdiction staff):_____

Permit Application and Plan Review Correction Sheet for Multi-Unit Dwellings (MUD) Electric Vehicle Charging Station

INSTRUCTIONS: This Correction Sheet shall be used during a multi-unit dwelling Electric Vehicle Charging Station (EVCS) installation permit application and plan review. If any discrepancies are found on the application and/or supplemental documentation, record the details of needed corrections on this Correction Sheet and provide to the applicant. Highlight or cite Correction Sheet section and item number in correction summary

Check One	Type of Charging Station(s) Proposed	Power Levels (proposed circuit rating)
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps
☐	Level 2 - 3.3 kilowatt (kW) (low)	208/240 VAC at 20 or 30 Amps
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps
☐	DC Fast Charging	440 or 480 VAC
☐	Other (provide detail)	

Section 1: PERMIT APPLICATION

1) Is the permit application complete with the following information: Project address, parcel #, builder/owner name, contractor name, valid contractor license #, phone numbers and any other requirement? Yes ☐ No ☐

Section 2: ELECTRICAL LOAD CALCULATION WORKSHEET

1) Is an electrical load calculation worksheet included? (CEC[5] 220) Yes ☐ No ☐
2) Based on the load calculation worksheet, is a new electrical service panel upgrade required[6]? Yes ☐ No ☐

[5] 2013 California Electrical Code. Article 220 Branch-Circuit, Feeder, and Service Calculations

[6] **Load Calculation Worksheet review instructions:** The size of the existing service MUST be equal to or larger than the Minimum Required Size of main service breaker. If the existing service panel is **smaller** than the minimum required size of existing electrical services, then **a new upgraded electrical service panel must be installed** in order to handle the added electrical load from the proposed EVCS.

a. If yes to Q2, do plans include the electrical service panel upgrade? Yes ☐ No ☐
b. If yes to Q2, is the SDG&E work order included with permit application? Yes ☐ No ☐

3) Is the charging circuit appropriately sized for a continuous load (125%)? Yes ☐ No ☐

Section 3: SITE PLAN

1) Is a site plan and electrical plan with a single-line diagram included with the permit application? Yes ☐ No ☐
    a. If mechanical ventilation requirements are triggered for indoor venting requirements (CEC 625.29 (D)), is a mechanical plan included with the permit application? Yes ☐No ☐
2) Is the site plan fully dimensioned and drawn to scale? Yes ☐ No ☐
    a. Showing location, size, and use of all structures? Yes ☐ No ☐
    b. Showing location of electrical panel to charging system? Yes ☐ No ☐
    c. Showing type of charging system and mounting? Yes ☐ No ☐
    d. Is the type of mounting for charging system included if the charging system is not wall-mounted? Yes ☐ No ☐ Not Applicable ☐

Section 4: COMPLIANCE WITH 2013 CALIFORNIA ELECTRCIAL CODE (TITLE 24, PART 3)

1) Does the plan include EVCS manufacturer's specs and installation guidelines? Yes ☐ No ☐
2) Does the electrical plan identify the amperage and location of existing electrical service panel? Yes ☐ No ☐
    a. If yes to Q2, does the existing panel schedule show room for additional breakers? Yes ☐ No ☐
    b. Are sizes for the conduit and conductor included? Yes ☐ No ☐
3) Is the charging unit rated more than 60 amps or more than 150V to ground? Yes ☐ No ☐
    a. If yes to Q3, are disconnecting means provided in a readily accessible location in line of site and within 50' of EVCS? (CEC 625.23) Yes ☐ No ☐
4) Does the charging equipment have a Nationally Recognized Testing Laboratory (NRTL) approved listing mark? (UL 2202/UL 2200) Yes ☐ No ☐
5) If trenching is required, is the trenching detail called out? Yes ☐ No ☐
    a. Is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐
    b. Is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Permit Number (for use by jurisdiction staff):_____

Section 5: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE FOR NEW CONSTRUCTION AND CHAPTER 11B ACCESSIBILITY REQUIREMENTS

2013 CALGreen Mandatory EVCS Requirements for New Construction[7]

1) Do CALGreen EV Readiness installation requirements apply to this project? Yes ☐ No ☐
    a. Should be identified during plan review (4.106.4.2)
    b. Do the plans demonstrate conformance with mandatory measures for 3% of total parking spaces, but no less than one, for new multifamily dwellings with 17+ units that must be EV capable? Yes ☐ No ☐2016 CALGreen proposed mandatory requirements for new construction include measures for 5% of total parking spaces, but no less than one, for new multifamily dwellings with 17+ units that must be EV capable (If approved, effective January 1, 2017)

2016 Chapter 11B Proposed EVCS Requirements (to go in effect January 1, 2017)[8]

1) Is there at least 1 EVCS parking stall out of 4 EVCS parking stalls that meet Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle)? Yes ☐ No ☐
    a. Access aisles shall comply with Section 11B-302.
2) For parking stalls with 5 to 25 EVCS, is there 1 EVCS parking stalls that meets Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle) and 1 EVCS parking stall that meets the standard accessible parking space (108 inches wide with an adjacent access aisle)? Yes ☐ No ☐
3) Is the path of travel to the EVCS from the accessible parking stall demonstrated to be unobstructed? Yes ☐ No ☐
4) Is the accessible path of travel from the EVCS parking stall demonstrated to be with 200 feet of a main building entrance? Yes ☐ No ☐

CORRECTION(S) SUMMARY:

_____

_____

_____

_____

[7] 2013 California Green Buildings Standards Code. Title 24, Part 11, Section 4.106.4.2 *Multi-family dwellings*
[8] 2016 California Building Code. Title 24, Part 2, Chapter 11B *Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing*, Section 228.3 *Electric Vehicle Chargers*

Permit Number (for use by jurisdiction staff):_____

Permit Application and Plan Review Correction Sheet for Non-Residential Electric Vehicle Charging Station

INSTRUCTIONS: This Correction Sheet shall be used during a non-residential Electric Vehicle Charging Station (EVCS) installation permit application and plan review. If any discrepancies are found on the application and/or supplemental documentation, record the details of needed corrections on this Correction Sheet and provide to the applicant. Highlight or cite Correction Sheet section and item number in correction summary.

Check One	Type of Charging Station(s) Proposed	Power Levels (proposed circuit rating)	Typical NON-RES Charging Locations
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps	• Commercial office building
☐	Level 2 - 3.3kW (low)	208/240 VAC at 20 or 30 Amps	• Multi-unit dwellings • Commercial office building • Public access
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps	
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps	
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps	
☐	DC Fast Charging	440 or 480 VAC	• Public access • Large commercial office buildings or parks • Hospitality & recreation
☐	Other (provide detail)		

Section 1: PERMIT APPLICATION

1) Is the permit application complete with the following information: Project address, parcel #, builder/owner name, contractor name, valid contractor license #, phone numbers and any other requirement? Yes ☐ No ☐

Section 2: ELECTRICAL LOAD CALCULATION WORKSHEET

1) Is an electrical load calculation worksheet included? (CEC[9] 220) Yes ☐ No ☐
2) Based on the load calculation worksheet, is a new electrical service panel upgrade required[10]? Yes ☐ No ☐

[9] 2013 California Electrical Code. Article 220 Branch-Circuit, Feeder, and Service Calculations

[10] **Load Calculation Worksheet review instructions:** The size of the existing service MUST be equal to or larger than the Minimum Required Size of main service breaker. If the existing service panel is **smaller** than the minimum

   a. If yes to Q2, do plans include the electrical service panel upgrade? Yes ☐ No ☐
   b. If yes to Q2, is the SDG&E work order included with permit application? Yes ☐ No ☐

3) Is the charging circuit appropriately sized for a continuous load (125%)? Yes ☐ No ☐
4) If charging equipment proposed is a DC Fast Charging station or a Level 2 - 9.6kW station with a circuit rating of 50 amps or higher, is a completed circuit card with electrical calculations included with the single-line diagram? Yes ☐ No ☐ Not Applicable ☐

Section 3: SITE PLAN

1) Is a site plan and electrical plan with a single-line diagram included with the permit application? Yes ☐ No ☐
   a. If mechanical ventilation requirements are triggered for indoor venting requirements (CEC 625.29 (D)), is a mechanical plan included with the permit application? Yes ☐ No ☐ Not Applicable ☐
2) Is the site plan fully dimensioned and drawn to scale? Yes ☐ No ☐
   a. Showing location, size, and use of all structures? Yes ☐ No ☐
   b. Showing location of electrical panel to charging system? Yes ☐ No ☐
   c. Showing type of charging system and mounting? Yes ☐ No ☐
   d. Is the type of mounting for charging system included if the charging system is not wall-mounted? Yes ☐ No ☐ Not Applicable ☐

Section 4: COMPLIANCE WITH 2013 CALIFORNIA ELECTRCIAL CODE (TITLE 24, PART 3)

1) Does the plan include EVCS manufacturer's specs and installation guidelines? Yes ☐ No ☐
2) Does the electrical plan identify the amperage and location of existing electrical service panel? Yes ☐ No ☐
   a. If yes, does the existing panel schedule show room for additional breakers?
   b. Are sizes for the conduit and conductor included? Yes ☐ No ☐
3) Is the charging unit rated more than 60 amps or more than 150V to ground? Yes ☐ No ☐
   a. If yes, are disconnecting means provided in a readily accessible location in line of site and within 50’ of EVCS? (CEC 625.23) Yes ☐ No ☐
4) Does the charging equipment have a Nationally Recognized Testing Laboratory (NRTL) approved listing mark? (UL 2202/UL 2200) Yes ☐ No ☐
5) If trenching is required, is the trenching detail called out? Yes ☐ No ☐
   a. Is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐

---

required size of existing electrical services, then **a new upgraded electrical service panel must be installed** in order to handle the added electrical load from the proposed EVCS.

b. Is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Section 5: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE FOR NEW CONSTRUCTION AND CHAPTER 11B ACCESSIBILITY REQUIREMENTS

2013 CALGreen Mandatory EVCS Requirements for New Construction[11]

1) Do CALGreen EV Readiness installation requirements apply to this project? Yes ☐ No ☐
   a. Should be identified during plan review (5.106.5.3)
2) Do the plans demonstrate conformance with mandatory measures of 3% of parking spaces in lots with 51+ spaces being EV capable? Yes ☐ No ☒ Not Applicable ☐
   a. 2016 CALGreen proposed mandatory requirements for new construction include measures for 6% of total parking spaces in lots with 10+ spaces being EV capable (If approved, effective January 1, 2017)

2016 Chapter 11B Proposed EVCS Requirements (to go in effect January 1, 2017)[12]

1) Is there at least 1 EVCS parking stall out of 4 EVCS parking stalls that meet Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle)? Yes ☐ No ☐
   a. Access aisles shall comply with Section 11B-302.

1) For parking stalls with 5 to 25 EVCS, is there 1 EVCS parking stalls that meets Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle) and 1 EVCS parking stall that meets the standard accessible parking space (108 inches wide with an adjacent access aisle)? Yes ☐ No ☐
2) Is the path of travel to the EVCS from the accessible parking stall demonstrated to be unobstructed? Yes ☐ No ☐
3) Is the accessible path of travel from the EVCS parking stall demonstrated to be with 200 feet of a main building entrance? Yes ☐ No ☐

CORRECTION(S) SUMMARY:

_____
_____
_____

[11] 2013 California Green Buildings Standards Code (CALGreen). Title 24, Part 11, Section 5.106.5.3 *Electric Vehicle (EV) Charging*

[12] 2016 California Building Code. Title 24, Part 2, Chapter 11B *Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing*, Section 228.3 *Electric Vehicle Chargers*

Permit Number (for use by jurisdiction staff):_____

Appendix D: Inspection Correction Sheets

Inspection Correction Sheet for Residential Electric Vehicle Charging Station

Instructions: This Correction Sheet shall be used during a final residential Electric Vehicle Charging Station (EVCS) building inspection. If any discrepancies are found on site or if anything differs from the application and supplemental documentation, record the details of needed corrections on this Correction Sheet and provide to the applicant at the end of the inspection. Highlight or cite Correction Sheet section and item number in correction summary.

Check One	Type of Charging Station(s) Installed	Power Levels (installed circuit rating)
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps
☐	Level 2 - 3.3 kilowatt (kW) (low)	208/240 VAC at 20 or 30 Amps
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps
☐	Other (provide detail)	

Section 1: ROUGH ELECTRICAL INSPECTION (if applicable)/ GENERAL INSPECTION ITEMS

1) Has the appropriate permit been obtained for this project? Yes ☐ No ☐
2) Has an electrical inspection of underground conduits and cables been completed? Yes ☐ No ☐ Not Applicable ☐
3) Have all conduit, cables, and junction boxes in walls or ceilings to-be-covered been inspected? Yes ☐ No ☐ Not Applicable ☐

Section 2: FINAL MECHANICAL INSPECTION (if applicable)

1) Is indoor mechanical ventilation required? (See CEC[13] 625.29 (D) for indoor venting requirements)? Yes ☐ No ☐
    a. If yes, is mechanical ventilation installed per Title 24, Part 6[14] and ASHRAE 62.2 requirements? Yes ☐ No ☐

Section 3: FINAL ELECTRICAL INSPECTION

[13] 2013 California Electrical Code. Title 24, Part 3, Article 625, *Electrical Vehicle Charging Station*
[14] 2013 California Building Energy Efficiency Standards, Title 24, Part 6, Section 120,

1) Does the EVCS installation match the approved set of plans and all supplemental permitting documents? Yes ☐ No ☐
    a. If yes, does the location of EVCS match the site plan? Yes ☐ No ☐
    b. If yes, does the charging unit installed match the manufacturer's specifications? Yes ☐ No ☐
2) Are proper electrical equipment clearances (36" deep x 30" wide x 6'6" high) provided? (CEC 110.26) Yes ☐ No ☐
3) Are San Diego Gas & Electric gas meter clearances adhered to? (18" for direct burial per CEC 300) Yes ☐ No ☐
4) Has physical protection or bollards been installed to prevent vehicle impact to equipment? Yes ☐ No ☐ Not Applicable ☐
    a. Has the equipment been mounted with the appropriate vertical clearance at a height of 18-48 inches above the finished floor? (CEC 625.29(B)) Yes ☐ No ☐
5) Do the proposed load calculations (per CEC Art. 220) for electrical service match the existing loads at the project site[15]? Yes ☐ No ☐
6) Are EVCS markings visible and compliant per CEC 625.15 and 625.29? Yes ☐ No ☐
7) Has an individual branch circuit for the EVCS and branch circuit wiring been installed[16]? Yes ☐ No ☐
8) Are all listed wiring and fittings securely fastened to the structure? (CEC 300.11) Yes ☐ No ☐
9) Are all branch circuit conductors appropriately sized to comply with rating of the overcurrent protection? (CEC 210.19, CEC 215.2(A), CEC 110.3(B); CEC 310.15(B)). Yes ☐ No ☐
10) Has overcurrent protection for any newly installed service equipment and conductors been installed? (CEC 230.90, 91). Yes ☐ No ☐
    a. If charging unit features adjustable operating current, does the current matches the installed wiring and overcurrent protection device? Yes ☐ No ☐ Not Applicable ☐
    a. Has a properly sized equipment grounding conductor (per CEC table 250.122) with the branch circuit been installed and identified? Yes ☐ No ☐
    b. If so, is there a connection at the EVCS and panelboard or service? (CEC 300.3(B))
11) Has a disconnect been installed in a readily accessible location for EVCS system that is rated more than 60 amps or more than 150 Volts to ground? (CEC 625.23) Yes ☐ No ☐
    c. Is the location of the disconnect in a readily accessible location in line of site and within 50'of the EVCS? Yes ☐ No ☐
    d. Are main service disconnects installed per CEC 230.71, 72? Yes ☐ No ☐

[15] **Load Calculation Worksheet review instructions:** The size of the existing service MUST be equal to or larger than the Minimum Required Size of main service breaker. If the existing service panel is **smaller** than the minimum required size of existing electrical services, then **a new upgraded electrical service panel must be installed** in order to handle the added electrical load from the proposed EVCS(CEC Art. 220)

[16] Branch circuit over-current protection, conductors, and feeders must be sized 125% of nameplate current. (CEC 625.21)

i. Are they grouped? Yes ☐ No ☐
ii. Are there more than 6 disconnect sets in any group? Yes ☐ No ☐

12) Have all new and existing branch circuit overcurrent protection devices and disconnects been identified and labeled in the electrical panel? (CEC 408.4 (A); CEC 110.22(A)) Yes ☐ No ☐
13) Are all EMT, IMC, and RMC securely fastened in place at least every 10' and within 3' of each outlet box, junction box, device box, cabinet, conduit body or other termination? (CEC 342.30 (A), 344.30 (A), 358.30 (A)) Yes ☐ No ☐
14) If trench work is required, is a trenching detail called out on the electrical plan and the scope of work (per CEC 225)? Yes ☐ No ☐Not Applicable ☐
    a. If yes to Q14, is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐
    b. If yes to Q14, is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Section 4: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE REQUIREMENTS FOR NEW CONSTRUCTION

2013 CALGreen Mandatory EVCS Requirements for New Construction[17]

2) Do CALGreen EV Readinessinstallation requirements apply to this project? Yes ☐ No ☐
    a. Should be identified during permit application review. (4.106.4.1)
3) Is the installation in conformance with requirements for future installation of electric vehicle supply equipment for one-and two-family dwellings and townhouses with attached private garages? Yes ☐ No ☐
    a. 2016 CALGreen proposed mandatory EVCS requirements for new construction (If approved, effective January 1, 2017)

CORRECTION(S) SUMMARY:

_____
_____
_____
_____

[17] 2013 California Green Buildings Standards Code (CALGreen). Title 24, Part 11, Section 4.106.4.1 *Electric Vehicle (EV) Charging*

Permit Number (for use by jurisdiction staff):_____

Inspection Correction Sheet for Multi-Unit Dwelling (MUD) Electric Vehicle Charging Station

Instructions: This Correction Sheet shall be used during an Electric Vehicle Charging Station (EVCS) building inspection. If any discrepancies are found on site or if anything differs from the application and supplemental documentation, record the details of needed corrections on this Correction Sheet and provide to the applicant at the end of the inspection. Highlight or cite Correction Sheet section and item number in correction summary.

Check One	Type of Charging Station(s) Installed	Power Levels (installed circuit rating)
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps
☐	Level 2 - 3.3 kilowatt(kW) (low)	208/240 VAC at 20 or 30 Amps
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps
☐	DC Fast Charging	440 or 480 VAC
☐	Other (provide detail)	

Section 1: ROUGH ELECTRICAL INSPECTION (if applicable)

1) Has the appropriate permit been obtained for this project? Yes ☐ No ☐
2) Has an electrical inspection of underground conduits and cables been completed? Yes ☐ No ☐
3) Have all conduit, cables, and junction boxes in walls to-be-covered been inspected? Yes ☐ No ☐

Section 2: FINAL MECHANICAL INSPECTION (if applicable)

1) Is indoor mechanical ventilation required? (See CEC[18] 625.29 (D) for indoor venting requirements). Yes ☐ No ☐
    a. If yes, is mechanical ventilation installed per Title 24, Part 6[19] and ASHRAE 62.2 requirements? Yes ☐ No ☐

[18] 2013 California Electrical Code. Title 24, Part 3, Article 625, *Electrical Vehicle Charging Station*
[19] 2013 California Building Energy Efficiency Standards, Title 24, Part 6, Section 120,

Permit Number (for use by jurisdiction staff):_____

Section 3: FINAL ELECTRICAL INSPECTION

1) Does the EVCS installation match the approved set of plans and all supplemental permitting documents? Yes ☐ No ☐
    a. If yes, does the location of EVCS match the site plan? Yes ☐ No ☐
    b. If yes, does the charging unit installed match the manufacturer's specifications? Yes ☐ No ☐
2) Are proper electrical equipment clearances (36" deep x 30" wide x 6'6" high) provided? (CEC 110.26) Yes ☐ No ☐
3) Are San Diego Gas & Electric gas meter clearances adhered to? (18" for direct burial per CEC 300) Yes ☐ No ☐
4) Has physical protection or bollards been installed to prevent vehicle impact to equipment? (CEC 110.27 (B)) Yes ☐ No ☐ Not Applicable ☐
5) Has the equipment been mounted with the appropriate vertical clearance at a height of 18-48 inches above the finished floor? (CEC 625.29(B)) Yes ☐ No ☐
6) Do the proposed load calculations for electrical service (per CEC Art. 220) match the existing loads at the project site[20]? Yes ☐ No ☐
7) Are EVCS markings visible and compliant per CEC 625.15 and 625.29? Yes ☐ No ☐
8) Has an individual branch circuit for the EVCS and branch circuit wiring been installed[21]? Yes ☐ No ☐
9) Are all branch circuit conductors appropriately sized to comply with rating of the overcurrent protection? (CEC 210.19, CEC 215.2(A), CEC 110.3(B); CEC 310.15(B)) Yes ☐ No ☐
10) Has overcurrent protection for any newly installed service equipment and conductors been installed? (CEC 230.90, 91)Yes ☐ No ☐
    b. If charging unit features adjustable operating current, does the current matches the install wiring and overcurrent protection device? Yes ☐ No ☐ Not Applicable ☐
    a. Has a properly sized equipment grounding conductor (per CEC table 250.122) with the branch circuit been installed and identified? Yes ☐ No ☐
    b. If so, is there a connection at the EVCS and panelboard or service? (CEC 300.3(B))
11) Are all listed wiring and fittings securely fastened to the structure? (CEC 300.11) Yes ☐ No ☐
12) Has a disconnect been installed in a readily accessible location for EVCS system that is rated more than 60 amps or more than 150 Volts to ground? (CEC 625.23) Yes ☐ No ☐
    a. Is the location of the disconnect in a readily accessible location in line of site and within 50' of the EVCS? Yes ☐ No ☐

[20] **Load Calculation Worksheet review instructions:** The size of the existing service MUST be equal to or larger than the Minimum Required Size of main service breaker. If the existing service panel is **smaller** than the minimum required size of existing electrical services, then **a new upgraded electrical service panel must be installed** in order to handle the added electrical load from the proposed EVCS. (CEC Art. 220)

[21] Branch circuit over-current protection, conductors, and feeders must be sized 125% of nameplate current. (CEC 625.21)

b. Are main service disconnects installed per CEC 230.71, 72? Yes ☐ No ☐
   iii. Are they grouped? Yes ☐ No ☐
   iv. Are there more than 6 disconnect sets in any group? Yes ☐ No ☐

13) Have all new and existing branch circuit overcurrent protection devices and disconnects been identified and labeled in the electrical panel? (CEC 408.4 (A); CEC 110.22(A)) Yes ☐ No ☐
14) Are all EMT, IMC, and RMC securely fastened in place at least every 10' and within 3' of each outlet box, junction box, device box, cabinet, conduit body or other termination? (CEC 342.30 (A), 344.30 (A), 358.30 (A)) Yes ☐ No ☐
15) If trench work is required, is a trenching detail called out on the electrical plan and the scope of work (per CEC 225)? Yes ☐ No ☐Not Applicable ☐
    a. If yes to Q14, is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐
    b. If yes to Q14, is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Section 4: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE FOR NEW CONSTRUCTION AND 2016 PROPOSED CHAPTER 11B ACCESSIBILITY REQUIREMENTS

2013 CALGreen Mandatory EVCS Requirements for New Construction[22]

1) Do CALGreen EV readiness installation requirements apply to this project? Yes ☐ No ☐
    a. Should be identified during plan review (4.106.4.2)
2) If yes to Q1, is the installation in conformance with mandatory measures for multifamily dwellings with 17+ units where at least 3% of total parking spaces, but not less than one percent, are EV capable? Yes ☐ No ☐
    a. 2016 CALGreen proposed mandatory requirements for multifamily dwellings with 17+ units where at least 5% of total parking spaces, but not less than one percent, are EV capable (If approved, effective January 1, 2017)

2016 Chapter 11B Proposed EVCS Requirements (to go in effect January 1, 2017)[23]

5) Do Chapter 11B mandatory EVCS parking stall requirements apply to this project? Yes ☐ No ☐
    a. Should be identified during plan review.
6) If yes to Q1, is there at least 1 EVCS parking stall out of 4 EVCS parking stalls that meet Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle)? Yes ☐ No ☐
    a. Access aisles shall comply with Section 11B-302.

[22] 2013 California Green Buildings Standards Code (CALGreen). Title 24, Part 11, Section 4.106.4.2 *Electric Vehicle (EV) Charging*
[23] 2016 California Building Code. Title 24, Part 2, Chapter 11B *Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing*, Section 228.3 *Electric Vehicle Chargers*

Permit Number (for use by jurisdiction staff):_____

7) For parking stalls with 5 to 25 EVCS, is there 1 EVCS parking stalls that meets Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle) and 1 EVCS parking stall that meets the standard accessible parking space (108 inches wide with an adjacent access aisle)? Yes ☐ No ☐
8) Is the path of travel to the EVCS from the accessible parking stall demonstrated to be unobstructed? Yes ☐ No ☐
9) Is the accessible path of travel from the EVCS parking stall demonstrated to be with 200 feet of a main building entrance? Yes ☐ No ☐

CORRECTION(S) SUMMARY:

_____

_____

_____

Permit Number (for use by jurisdiction staff):_____

Inspection Correction Sheet for Non-Residential Electric Vehicle Charging Station

Instructions: This Correction Sheet shall be used during a final Electric Vehicle Charging Station (EVCS) building inspection. If any discrepancies are found on site, record the needed corrections on this Correction Sheet and provide to the applicant at the end of the inspection. Highlight or cite Correction Sheet section and item number in correction summary.

Check One	Type of Charging Station(s) Installed	Power Levels (installed circuit rating)	Typical NON-RES Charging Locations
☐	Level 1	110/120 volt alternating current (VAC) at 15 or 20 Amps	• Commercial office building
☐	Level 2 - 3.3kW (low)	208/240 VAC at 20 or 30 Amps	• Multi-unit dwellings • Commercial office building • Public access
☐	Level 2 - 6.6kW (medium)	208/240 VAC at 40 Amps	
☐	Level 2 - 9.6kW (high)	208/240 VAC at 50 Amps	
☐	Level 2 - 19.2kW (highest)	208/240 VAC at 100 Amps	
☐	DC Fast Charging	440 or 480 VAC	• Public access • Large commercial office buildings or parks • Hospitality & recreation
☐	Other (provide detail)		

Section 1: ROUGH ELECTRICAL INSPECTION (if applicable)

1) Has the appropriate permit been obtained for this project? Yes ☐ No ☐
2) Has an electrical inspection of underground conduits and cables been completed? Yes ☐ No ☐
3) Have all conduit, cables, and junction boxes in walls or ceilings to-be-covered been inspected? Yes ☐ No ☐

Section 2: FINAL MECHANICAL INSPECTION (if applicable)

1) Is indoor mechanical ventilation required? (See CEC[24] 625.29 (D) for indoor venting requirements)? Yes ☐ No ☐
    a. If yes to Q1, is mechanical ventilation installed per Title 24, Part 6[25] and ASHRAE 62.2 requirements? Yes ☐ No ☐

[24] 2013 California Electrical Code. Title 24, Part 3, Article 625, *Electrical Vehicle Charging Station*
[25] 2013 California Building Energy Efficiency Standards, Title 24, Part 6, Section 120,

Permit Number (for use by jurisdiction staff):_____

Section 3: FINAL ELECTRICAL INSPECTION

1) Does the EVCS installation match the approved set of plans and all supplemental permitting documents? Yes ☐ No ☐
    a. If yes to Q1, does the location of EVCS match the site plan? Yes ☐ No ☐
    b. If yes to Q1, does the charging unit installed match the manufacturer's specifications? Yes ☐ No ☐
2) Are proper electrical equipment clearances (36" deep x 30" wide x 6'6" high) provided? (CEC 110.26) Yes ☐ No ☐
3) Are San Diego Gas & Electric gas meter clearances adhered to? (18" for direct burial per CEC 300) Yes ☐ No ☐
4) Has physical protection or bollards been installed to prevent vehicle impact to equipment? (CEC 110.27 (B)) Yes ☐ No ☐ Not Applicable ☐
5) Has the equipment been mounted with the appropriate vertical clearance at a height of 18-48 inches above the finished floor? (CEC 625.29(B)) Yes ☐ No ☐Not Applicable ☐
6) Do the proposed load calculations (per CEC art. 220) for electrical service match the existing loads at the project site? Yes ☐ No ☐
7) Are EVCS markings visible and compliant per CEC 625.15 and 625.29? Yes ☐ No ☐
8) Has an individual branch circuit for the EVCS and branch circuit wiring been installed[26]? Yes ☐ No ☐
9) Are all branch circuit conductors appropriately sized to comply with rating of the overcurrent protection? (CEC 210.19, CEC 215.2(A), CEC 110.3(B); CEC 310.15(B)) Yes ☐ No ☐
10) Has overcurrent protection for any newly installed service equipment and conductors been installed? (CEC 230.90, 91) Yes ☐ No ☐
    c. If charging unit features adjustable operating current, does the current matches the install wiring and overcurrent protection device? Yes ☐ No ☐ Not Applicable ☐
    d. Has a properly sized equipment grounding conductor (per CEC table 250.122) with the branch circuit been installed and identified? Yes ☐ No ☐
    e. If so, is there a connection at the EVCS and panelboard or service? (CEC 300.3(B))
11) Are all listed wiring and fittings securely fastened to the structure? (CEC 300.11) Yes ☐ No ☐
12) Has a disconnect been installed in a readily accessible location for EVCS system that is rated more than 60 amps or more than 150 Volts to ground? (CEC 625.23) Yes ☐ No ☐
    a. Is the location of the disconnect in a readily accessible location in line of site and within 50'of the EVCS? Yes ☐ No ☐
    b. Are main service disconnects installed per CEC 230.71, 72? Yes ☐ No ☐
        v. Are they grouped? Yes ☐ No ☐
        vi. Are there more than 6 disconnect sets in any group? Yes ☐ No ☐

[26] Branch circuit over-current protection, conductors, and feeders must be sized 125% of nameplate current. (CEC 625.21)

13) Have all new and existing branch circuit overcurrent protection devices and disconnects been identified and labeled in electrical panel? (CEC 408.4 (A); CEC 110.22(A)) Yes ☐ No ☐
14) Are all EMT, IMC, and RMC securely fastened in place at least every 10' and within 3' of each outlet box, junction box, device box, cabinet, conduit body or other termination? (CEC 342.30 (A), 344.30 (A), 358.30 (A)) Yes ☐ No ☐
15) If trench work is required, is a trenching detail called out on the electrical plan and the scope of work (per CEC 225)? Yes ☐ No ☐Not Applicable ☐
    a. If yes to Q14, is the trenching in compliance with electrical feeder requirements from structure to structure? (CEC 225) Yes ☐ No ☐
    b. If yes to Q14, is the trenching in compliance of minimum cover requirements for wiring methods or circuits? (18" for direct burial per CEC 300) Yes ☐ No ☐

Section 4: COMPLIANCE WITH 2013 MANDATORY CALGREEN CODE FOR NEW CONSTRUCTION AND 2016 PROPOSED CHAPTER 11B ACCESSIBILITY REQUIREMENTS

2013 CALGreen Mandatory EVCS Requirements for New Construction[27]

1) Do CALGreen EV Readiness installation requirements apply to this project? Yes ☐ No ☐
    a. Should be identified during plan review (5.106.5.3)
2) If yes to Q1, is the installation in conformance with mandatory measures of 3% for new construction of parking spaces in lots with 51+ spaces being EV capable? Yes ☐ No ☐ Not Applicable ☐
    a. 2016 CALGreen proposed mandatory requirements for new construction include measures for 6% of total parking spaces in lots with 10+ spaces being EV capable (If approved, effective January 1, 2017)

2016 Chapter 11B Proposed EVCS Requirements (to go in effect January 1, 2017)[28]

1) Is there at least 1 EVCS parking stall out of 4 EVCS parking stalls that meet Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle)? Yes ☐ No ☐
    a. Access aisles shall comply with Section 11B-302.
2) For parking stalls with 5 to 25 EVCS, is there 1 EVCS parking stalls that meets Chapter 11B accessibility dimension requirements for a van accessible parking space (144 inches wide with an adjacent access aisle) and 1 EVCS parking stall that meets the standard accessible parking space (108 inches wide with an adjacent access aisle)? Yes ☐ No ☐
3) Is the path of travel to the EVCS from the accessible parking stall demonstrated to be unobstructed? Yes ☐ No ☐

[27] 2013 California Green Buildings Standards Code (CALGreen). Title 24, Part 11, Section 5.106.5.3 *Electric Vehicle (EV) Charging*
[28] 2016 California Building Code. Title 24, Part 2, Chapter 11B *Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing*, Section 228.3 *Electric Vehicle Chargers*

Permit Number (for use by jurisdiction staff):_____

4) Is the accessible path of travel from the EVCS parking stall demonstrated to be with 200 feet of a main building entrance? Yes ☐ No ☐

CORRECTION(S) SUMMARY:

_____
_____
_____
_____

Endnotes

[i] During 2012-13, REVI identified major barriers to EVCS deployment and PEV adoption through collaboration with local jurisdictions, regional public agencies, San Diego Gas & Electric, local universities and community colleges, IBEW Local 569, the National Electric Contractors Association and the local San Diego business community. The outcome of REVI was the San Diego Regional PEV Readiness Plan that identifies and resolves barriers to the widespread deployment of private and public PEV charging infrastructure, http://www.sandag.org/index.asp?projectid=413&fuseaction=projects.detail.

[ii] *Zero-Emission Vehicles in California: Community Readiness Guidebook* (2013), Governor's Office of Planning and Research, http://opr.ca.gov/docs/ZEV_Guidebook.pdf.

[iii] PEVs include battery electric vehicles and plug-in hybrid electric vehicles.

[iv] Center for Sustainable Energy (2016). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last updated June 6, 2016. Retrieved June 16, 2016 from https://cleanvehiclerebate.org/eng/rebate-statistics.

[v] Governor Brown's Zero-Emission Vehicle Executive Order, March 23, 2012, https://www.gov.ca.gov/news.php?id=17463.

[vi] Alternative Fuels Data Center, Alternative Fuel Stations Dataset. Data last updated September 28, 2015. Retrieved September 28, 2015, from http://www.afdc.energy.gov/data_download/.

[vii] National Renewable Energy Laboratory, California Statewide Plug-In Electric Vehicle Infrastructure Assessment, 2014, http://www.energy.ca.gov/2014publications/CEC-600-2014-003/CEC-600-2014-003.pdf.

[viii] San Diego Regional Plug-In Electric Vehicle Readiness Plan (2014), p. 13, http://www.sandag.org/uploads/publicationid/publicationid_1817_17061.pdf.

[ix] Ibid. p. 25.

[x] *Zero-Emission Vehicles in California: Community Readiness Guidebook* (2013), Governor's Office of Planning and Research, http://opr.ca.gov/docs/ZEV_Guidebook.pdf.

[xi] The City of Oceanside Residential Electric Vehicle Charger Guidelines, 2013, http://www.ci.oceanside.ca.us/civicax/filebank/blobdload.aspx?blobid=30053.

[xii] City of San Diego *Technical Policy 11B-1*, http://www.sandiego.gov/development-services/pdf/industry/tpolicy11b1.pdf.

[xiii] International Code Council, *2010 California Building Code, Title 24, Part 2, Chapter 11B,* http://publicecodes.cyberregs.com/st/ca/st/b200v10/st_ca_st_b200v10_11b_sec001.htm.

[xiv] Division of the State Architect, Final Express Terms for Proposed Building Standards of the Division of the State Architect (DSA-AC), pages 74-90, http://www.documents.dgs.ca.gov/dsa/access/2016-Pt2_Final-Express-Terms_12-22-15.pdf.

[xv] Chula Vista's EV Guide, http://www.chulavistaca.gov/departments/development-services/building/build-green/permits#nrev.

[xvi] National City Electric Vehicle Supply Equipment Permit Guide E-1, http://nationalcityca.gov/modules/ShowDocument.aspx?documentid=11402.

[xvii] U. S. Department of Energy Permit for Charging Equipment Installation, 2012, http://www.afdc.energy.gov/pdfs/EV_charging_template.pdf.

[xviii] City of San Diego SimplEPermits, http://www.sandiego.gov/development-services/industry/simplepermits/index.shtml.