

Plug-in Electric Vehicles

Resources for Electrical Contractors in San Diego

San Diego accounts for more than 20% of total statewide plug-in electric vehicle (PEV) sales and has the largest all-electric vehicle car-sharing program in North America. With every PEV purchase, the need for charging infrastructure expands and the demand for local electrical contractors grows.

Electrical Vehicle Supply Equipment Training

The PEV industry and local governments want to ensure contractors are completing safe and reliable electric vehicle supply equipment (EVSE) installations for their customers and constituents.

The International Brotherhood of Electrical Workers, in conjunction with the National Electrical Contractors Association, offers statewide EVSE installation training courses. The Electric Vehicle Infrastructure Training Program (EVITP) is designed for and available to all electrical contractors addressing best practices for residential, commercial, public, and fleet installations.

EVITP training is offered at regional community colleges and electric training centers. For information and a list of EVITP training opportunities, visit <http://www.evitp.org/training-programs> or email info@evitp.org.

Training benefits to electrical contractors include:

- Learning new and emerging technologies
- Gaining competitive knowledge
- Qualifying to submit bids for RFQs and RFPs for EVSE installations
- Supporting California's goal to reach 1.5 million zero-emission vehicles on the road by 2025

Electric Vehicle Supply Equipment Options

There are numerous EVSE product manufacturers and retailers. Many EVSE products are safety tested and certified by Underwriters Laboratories (UL). For a complete list of currently approved EVSE, visit <http://goelectricdrive.com/index.php/find-an-ev-charger>.

Electrical Vehicle Supply Equipment Installation and Maintenance

Every EVSE installation is different. The following resources address EVSE safety as well as technical and consumer issues electrical contractors and inspectors may encounter.

Regulatory Compliance

The City of San Diego requires EVSE installations in public areas to be made accessible to persons with disabilities. The City of San Diego Technical Policy 11B-1 applies to the installation of EVSE in both new and existing construction. More information can be found at: <https://www.sandiego.gov/development-services/pdf/industry/tpolicy11b1.pdf>.

For installations outside the City of San Diego, contact the local permitting office for accessibility guidelines.

Nearest EVITP training centers:

1. San Diego Electrical Training Trust
www.positivelyelectric.org
858-569-6633
4675 Viewridge Ave.
San Diego, CA 92123
2. Cuyamaca College
<http://www.cuyamaca.edu/>
619-660-4000
900 Rancho San Diego Pkwy.
El Cajon, CA 92019
3. Orange County Electrical JATC
www.ocett.org
714-245-9988
717 South Lyon Street
Santa Ana, CA 92705

The Alternative Fuels Data Center (AFDC) lists California laws, state incentives, and regulations related to PEVs and other advanced vehicles, which is found at: http://www.afdc.energy.gov/laws/state_summary/CA.

Installation and Inspection

The EVSE installation process begins with a site assessment and identifying the EVSE.

The City of San Diego has developed an information bulletin that describes the permitting and inspection process for EVSE on an existing site or building, found here: <http://www.sandiego.gov/development-services/pdf/industry/infobulletin/ib187.pdf>.

Common EVSE installation steps are also included in Advanced Energy's document, *Charging Station Installation Handbook for Electrical Contractors and Inspectors*.¹

Load Calculations

Load calculations are a required component of most electrical permit submittals. The National Electric Code (NEC) considers EVSE a continuous load. EVSE-specific information can be reviewed in NEC Article 625 by visiting http://www.advancedenergy.org/transportation/charging_station_forum.

The City of Oceanside has developed an EVSE load calculation worksheet and included it within the *Residential Electric Vehicle Charger Guidelines* (see *Residential Installations*).

Residential Installations

Most PEV charging takes place at home, overnight using Level 1 (120 volt) or Level 2 (240 volt) EVSE. EVSE is most often installed in a garage. EVSE installations for a single-family residence that can accommodate Level 2 EVSE is usually simple and straightforward. Installations may become more complex if an electrical service upgrade is required. Charging at multifamily developments offer additional considerations and often comes with higher cost estimates.

The cities of Oceanside and San Diego have developed guidance documents to help streamline the electric vehicle charger permitting process.

- City of Oceanside *Residential Electric Vehicle Charger Guidelines*
<http://www.ci.oceanside.ca.us/civica/filebank/blobload.asp?BlobID=30053>
- City of San Diego *Information Bulletin 187: How to Obtain a Permit for Electrical Vehicle Charging Systems*
<http://www.sandiego.gov/development-services/pdf/industry/infobulletin/ib187.pdf>

Nonresidential Installations

Nonresidential EVSE locations include vehicle fleet facilities, workplaces, retail stores, parking lots, commercial garages, and other government-owned public spaces. The following sections in the *EV Project's San Diego EVSE Guidelines for public and commercial EVSE installations* provide more information about various installations²:

- Installation process for commercial fleet operations (p. 27)
- Installation flowchart for public charging (p. 34)

The Clean Cities Coalition *Electric Vehicle Handbook* includes detailed information on all of these topics and more at <http://www.afdc.energy.gov/pdfs/51228.pdf>.

¹ http://www.bc3sfbay.org/uploads/5/3/3/9/5339154/charging_handbook.pdf

² <http://www.theevproject.com/downloads/documents/Electric%20Vehicle%20Charging%20Infrastructure%20Deployment%20Guidelines%20for%20the%20Greater%20San%20Diego%20Area%20Ver%203.2.pdf>