

## Plug-In Electric Vehicle Infrastructure Permitting Checklist

**Snapshot:** Once a local government decides what information to require in an electric vehicle supply equipment (EVSE) permit application, it is a best practice to combine requirements and guidance into a single document that can guide plug-in electric vehicle owners through the process. This document should contain information on the conditions under which an EVSE permit is required, EVSE permit application requirements, the number and type (e.g., preinstallation, postinstallation) of inspections required and applicable codes and guidance regarding EVSE installation. The **California Plug-In Electric Vehicle Collaborative** created the following checklist.

## Permitting Checklist

	Residential	Non-Residential
<b>Phase 1</b> <b>Pre-Work</b> <b>Contractor</b>	<ul style="list-style-type: none"> <li>✓ Understands intended use of the EVSE (i.e. personal)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Obtain an address for the location</li> <li>✓ Determine the ownership of the site and/or authorization to install equipment at site</li> <li>✓ Understands intended use of the EVSE (i.e., fleet, employee, customer, visitor, etc.)</li> <li>✓ Determine number of vehicles charging and connectors per charging station</li> <li>✓ Determine source of power and authorization to use source</li> </ul>
	<ul style="list-style-type: none"> <li>✓ Determine type of vehicle(s) to be charged at EVSE</li> <li>✓ Evaluate mounting type options (i.e., bollard, pole-mount, wall-mount, ceiling-mount)</li> <li>✓ Clarify communication requirements (i.e., Ethernet, cellular, Wi-Fi, none or other)</li> <li>✓ Determine the NEMA Enclosure type</li> <li>✓ Determine the physical dimensions of the space(s)</li> <li>✓ Inspect the type of circuit breaker panel board intended for the installation</li> </ul>	
<b>Phase 2</b> <b>Pre-Work</b> <b>Customer</b>	<ul style="list-style-type: none"> <li>✓ Identify incentives or rate structures through the utility</li> <li>✓ Determine size of electrical service at the site</li> <li>✓ Identify and contact applicable local permit office(s) to identify specific requirements, including local fire, environmental, construction, building, concealment and engineering requirements</li> <li>✓ Identify incentives available through local, state or federal programs</li> <li>✓ Contact insurance company to acquire additional insurance or separate coverage as needed</li> <li>✓ Hire the contractor and verify credentials with all subcontractors; ensure electrical contractor's license for electrical work is current</li> </ul>	
<b>Phase 3</b> <b>On-Site</b> <b>Evaluation</b>	<ul style="list-style-type: none"> <li>✓ Verify EVSE meets UL requirements and is listed by UL or another nationally recognized testing laboratory</li> <li>✓ Verify EVSE has an appropriate NEMA rated enclosure (NEC 110.28) based on environment and customer needs, such as weatherization or greater levels of resistance to water and corrosive agents</li> <li>✓ Determine the level or charger meets customer's PEV requirements (most vehicles require the maximum of a 240V/32A (40A breaker)</li> <li>✓ Based on proposed EVSE location, determine if cord length will reach a vehicle's charging inlet without excessive slack and does not need to be more than 25' in length (NEC 625.17)</li> <li>✓ Cord management methodologies have been considered to reduce the risk of tripping hazards and accidental damage to the connector</li> <li>✓ Mounting type selection based on requirements to meet site guidelines</li> <li>✓ Determine whether EVSE communication options are beneficial to customer and/or local utility</li> </ul>	

**Phase 4**  
**On-Site**  
**Survey**

- ✓ Ensure overhead doors and vehicle parking spot do not conflict with EVSE location
- ✓ Place EVSE in a location convenient to charging port on vehicle and typical orientation of the vehicle in garage (i.e., backed in or head-first)
- ✓ Ensure functionality of lighting in the garage to meet NEC code 210-70

- ✓ Space(s) should be visible to drivers and pedestrians
- ✓ Determine proximity to building entrance (could be considered an incentive for PEV use)
- ✓ Select spaces proximate to existing transformer or panel with sufficient electrical capacity
- ✓ EVSE installation should maintain a minimum parking space length to comply with local zoning requirements
- ✓ If available, use wider spaces to reduce the risk of cord damage and minimize the intersection of cords with walking paths
- ✓ Ensure sufficient lighting at proposed space(s) to reduce the risk of tripping and damage to charging station from vehicle impact or vandalism; light levels above two foot candles are recommended
- ✓ Address accessibility requirements (refer to the Plug-In Electric Vehicle Infrastructure and Equipment Accessibility section of the Guidebook for more information)
- ✓ Determine availability of space for informative signing
- ✓ EVSE with multiple cords should be placed to avoid crossing other parking spaces
- ✓ All available charging station mounting options should be considered and optimized for the space
- ✓ Determine if hazardous materials were located at the site

**PARKING DECKS**

- ✓ Place EVSE towards the interior of a parking deck to avoid weather-related impacts on equipment

**PARKING LOTS**

- ✓ Avoid existing infrastructure and landscaping to mitigate costs, potential hazards and other negative impacts

**ON-STREET**

- ✓ Install on streets with high foot and vehicle traffic to mitigate vandalism
- ✓ Avoid existing infrastructure to mitigate costs, potential hazards and other negative impacts
- ✓ Address accessibility requirements (refer to the Plug-In Electric Vehicle Infrastructure and Equipment Accessibility section of the Guidebook for more information)

		<ul style="list-style-type: none"> <li>✓ For pull-in spaces, EVSE should be placed in front of the space and either centered on the space if placed between two spaces (if two connectors are available); EVSE with more than two connectors should not be used in on-street applications</li> <li>✓ For parallel parking locations, the charging station should be installed at the front third of the parked vehicle and based on the direction of traffic flow; EVSE with a single connector is recommended to reduce potential trip hazards</li> </ul>
<p><b>Phase 4</b> <b>Contractor Installation Preparation</b></p>	<ul style="list-style-type: none"> <li>✓ Mount the connector at a height between 36" and 48" from the ground (NEC 625.29) unless otherwise indicated by the manufacturer</li> <li>✓ Install wall or pole-mount stations and enclosures at a height between 36" and 48"</li> <li>✓ Ensure sufficient space exists around electrical equipment for safe operation and maintenance (NEC 110.26); recommended space is 30" wide, 3' deep and 6'6" high</li> <li>✓ Minimize tripping hazards and utilize cord management technologies when possible</li> <li>✓ Equipment operating above 50 volts must be protected against physical damage (NEC 110.27); ensure the vehicle is out of the line of vehicle travel and use wheel stops or other protective measures</li> <li>✓ EVSE must be located such that ADA routes maintain a pathway of 36" at all times</li> </ul>	
<p><b>Phase 5</b> <b>Installation</b></p>	<ul style="list-style-type: none"> <li>✓ Residential garages may permit the use of nonmetallic-sheathed cable in lieu of conduit</li> </ul>	<ul style="list-style-type: none"> <li>✓ Run conduit from power source to station location</li> <li>✓ For EVSE greater than 60 amperes, a separate disconnect is required (NEC 625.23) and should be installed concurrently with conduit and visible from the EVSE</li> </ul>
<ul style="list-style-type: none"> <li>✓ Post permit at site in visible location</li> <li>✓ Remove material to run conduit and/or wiring (i.e., drywall, insulation, pavers, concrete, pavement, earth, etc.</li> <li>✓ Contractors are encouraged to examine requirement for installation sites and types of wiring in Chapter 3 of the NEC</li> <li>✓ Pull wiring; charging stations require a neutral line and a ground line and equipment is considered to be a continuous load</li> </ul>		

	<ul style="list-style-type: none"> <li>✓ Conductors should be sized to support 125% of the rated equipment load (NEC 625.21)</li> <li>✓ Preparing mounting surface and install per equipment manufacturer instructions</li> <li>✓ Floor-mount: typically requires a concrete foundation with J-bolts on station base; place with space to allow conductors to enter through the base</li> <li>✓ Wall/pole/ceiling-mount: install brackets for mounting of the equipment</li> <li>✓ Install bollard(s) and/or wheel stop(s) as needed</li> <li>✓ Install informative signage to identify the EVSE and potential trip hazards</li> <li>✓ Install additional electrical panels or subpanels as needed</li> <li>✓ Install service upgrades, new service and/or new meter as needed; utility may also pull a meter to allow for charging station wires to be connected to a panel</li> <li>✓ Make electrical connection</li> <li>✓ Perform finish work to repair existing infrastructure, surfaces and landscaping</li> </ul>
<p><b>Phase 6 Inspection</b></p>	<ul style="list-style-type: none"> <li>✓ An initial electrical inspection by applicable building, fire, environmental and electrical authorities should occur after conduit has been run and prior to connecting equipment and running wires; if necessary, contractor should correct any issues and schedule a second rough inspection</li> <li>✓ If required, the inspector will perform a final inspection to ensure compliance with NEC and other codes adopted within the jurisdiction by inspecting wiring, connections, mounting and finish work</li> <li>✓ Contractor should verify EVSE functionality</li> </ul>
<p><b>Additional Resources</b></p>	<ul style="list-style-type: none"> <li>✓ National Codes and Standards</li> <li>✓ American National Standards Institute (ANSI)</li> <li>✓ National Fire Protection Association (NFPA)</li> <li>✓ Underwriters Laboratories, Inc. (UL)</li> <li>✓ International Association of Electrical Inspectors (IAEI)</li> <li>✓ International Code Council (ICC)</li> <li>✓ NECA-NEIS Standards</li> <li>✓ NECA and NFPA Webinars</li> <li>✓ Electrical Vehicle Infrastructure Training Program (EVITP) Installer Training Course/Certification</li> </ul>