



## Plug-In Electric Vehicle Infrastructure Permitting Checklist

<b>Permitting Checklist</b>		
	<b>Residential</b>	<b>Non-Residential</b>
<b>Phase 1 Pre-Work Contractor</b>	<ul style="list-style-type: none"> <li>✓ Personally understands intended use of the Electric Vehicle Service Equipment (EVSE )</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 Pre-Work 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 On-Site 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>	

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<b>Phase 4</b> <b>On-Site Survey</b>	<ul style="list-style-type: none"> <li>✓ Ensure overhead doors and vehicle parking spot do not conflict with EVSE location</li> <li>✓ 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)</li> <li>✓ Ensure functionality of lighting in the garage to meet NEC code 210-70</li> </ul>	<ul style="list-style-type: none"> <li>✓ Space(s) should be visible to drivers and pedestrians</li> <li>✓ Determine proximity to building entrance (could be considered an incentive for PEV use)</li> <li>✓ Site PEV spaces in locations that do not impact accessible parking spaces</li> <li>✓ Select spaces proximate to existing transformer or panel with sufficient electrical capacity</li> <li>✓ EVSE installation should maintain a minimum parking space length to comply with local zoning requirements</li> <li>✓ If available, use wider spaces to reduce the risk of cord damage and minimize the intersection of cords with walking paths</li> <li>✓ 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</li> <li>✓ Address accessibility requirements (refer to the Plug-In Electric Vehicle Infrastructure and Equipment Accessibility section of the Guidebook for more information)</li> <li>✓ Determine availability of space for informative signing</li> <li>✓ EVSE with multiple cords should be placed to avoid crossing other parking spaces</li> <li>✓ All available charging station mounting options should be considered and optimized for the space</li> <li>✓ Determine if hazardous materials were located at the site</li> </ul> <p><u>PARKING DECKS</u></p> <ul style="list-style-type: none"> <li>✓ Place EVSE towards the interior of a parking deck to avoid weather-related impacts on equipment</li> </ul> <p><u>PARKING LOTS</u></p> <ul style="list-style-type: none"> <li>✓ Avoid existing infrastructure and landscaping to mitigate costs, potential hazards and other negative impacts</li> </ul> <p><u>ON-STREET</u></p> <ul style="list-style-type: none"> <li>✓ Install on streets with high foot and vehicle traffic to mitigate vandalism</li> </ul>

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		<ul style="list-style-type: none"> <li>✓ Avoid existing infrastructure to mitigate costs, potential hazards and other negative impacts</li> <li>✓ Address accessibility requirements (refer to the Plug-In Electric Vehicle Infrastructure and Equipment Accessibility section of the Guidebook for more information)</li> <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>
	<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>	
<b>Phase 4 Contractor Installation Preparation</b>	<ul style="list-style-type: none"> <li>✓ Price quote submitted to customer and approved including utility upgrades</li> <li>✓ Order equipment</li> <li>✓ Provide stamped engineering calculations as needed</li> <li>✓ Provide site plan modification with diagrams as necessary</li> <li>✓ Complete all necessary service upgrades and/or new service assessments</li> <li>✓ Complete permit applications as required by local permitting department</li> <li>✓ Ensure permit is approved and collected</li> <li>✓ Schedule all necessary contract work (i.e., boring, concrete and/or paving restoration) and utility work (i.e., utility marking, service upgrade, new service and/or meter pull)</li> <li>✓ Ensure utility marking of existing power lines, gas lines or other infrastructure is completed and utilize "call before you dig" services</li> </ul>	
<b>Phase 5 Installation</b>	<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>

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	<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> <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>	
<b>Phase 6 Inspection</b>	<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>	
<b>Additional Resources</b>	<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>	