

GENERAL GUIDELINES AND REQUIREMENTS:
ELECTRIC VEHICLE CHARGING STATIONS AND SERVICE EQUIPMENT (EVSE)
RESIDENTIAL AND NON-RESIDENTIAL

| | Residential | Non-Residential |
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| Phase 1 Pre-Work Contractor | <ul style="list-style-type: none"> ✓ Understands intended use of the EVSE (i.e. personal) | <ul style="list-style-type: none"> ✓ Obtain an address for the location ✓ Determine the ownership of the site and/or authorization to install equipment at site ✓ Understands intended use of the EVSE (i.e., fleet, employee, customer, visitor, etc.) ✓ Determine number of vehicles charging and connectors per charging station ✓ Determine source of power and authorization to use source |
| | <ul style="list-style-type: none"> ✓ Determine type of vehicle(s) to be charged at EVSE ✓ Evaluate mounting type options (i.e., bollard, pole-mount, wall-mount, ceiling-mount) ✓ Clarify communication requirements (i.e., Ethernet, cellular, Wi-Fi, none or other) ✓ Determine the NEMA Enclosure type ✓ Determine the physical dimensions of the space(s) ✓ Inspect the type of circuit breaker panel board intended for the installation | |
| Phase 2 Pre-Work Customer | <ul style="list-style-type: none"> ✓ Identify incentives or rate structures through the utility ✓ Determine size of electrical service at the site ✓ Identify and contact applicable local permit office(s) to identify specific requirements, including local fire, environmental, construction, building, concealment and engineering requirements ✓ Identify incentives available through local, state or federal programs ✓ Contact insurance company to acquire additional insurance or separate coverage as needed ✓ Hire the contractor and verify credentials with all subcontractors; ensure electrical contractor's license for electrical work is current | |
| Phase 3 On-Site Evaluation | <ul style="list-style-type: none"> ✓ Verify EVSE meets UL requirements and is listed by UL or another nationally recognized testing laboratory ✓ 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 ✓ Determine the level or charger meets customer's PEV requirements (most vehicles require the maximum of a 240V/32A (40A breaker) ✓ 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) ✓ Cord management methodologies have been considered to reduce the risk of tripping hazards and accidental damage to the connector ✓ Mounting type selection based on requirements to meet site guidelines ✓ Determine whether EVSE communication options are beneficial to customer and/or local utility | |

**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)
- ✓ 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

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| | | <p>more than two connectors should not be used in on-street applications</p> <ul style="list-style-type: none"> ✓ 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 |
| | <ul style="list-style-type: none"> ✓ Mount the connector at a height between 36" and 48" from the ground (NEC 625.29) unless otherwise indicated by the manufacturer ✓ Install wall or pole-mount stations and enclosures at a height between 36" and 48" ✓ 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 ✓ Minimize tripping hazards and utilize cord management technologies when possible ✓ 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 ✓ EVSE must be located such that ADA routes maintain a pathway of 36" at all times | |
| <p>Phase 4 Contractor Installation Preparation</p> | <ul style="list-style-type: none"> ✓ Price quote submitted to customer and approved including utility upgrades ✓ Order equipment ✓ Provide stamped engineering calculations as needed ✓ Provide site plan modification with diagrams as necessary ✓ Complete all necessary service upgrades and/or new service assessments ✓ Complete permit applications as required by local permitting department ✓ Ensure permit is approved and collected ✓ 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) ✓ Ensure utility marking of existing power lines, gas lines or other infrastructure is completed and utilize "call before you dig" services | |
| <p>Phase 5 Installation</p> | <ul style="list-style-type: none"> ✓ Residential garages may permit the use of nonmetallic-sheathed cable in lieu of conduit | <ul style="list-style-type: none"> ✓ Run conduit from power source to station location ✓ 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 |
| | <ul style="list-style-type: none"> ✓ Post permit at site in visible location ✓ Remove material to run conduit and/or wiring (i.e., drywall, insulation, pavers, concrete, pavement, earth, etc. ✓ Contractors are encouraged to examine requirement for installation sites and types of wiring in Chapter 3 of the NEC ✓ Pull wiring; charging stations require a neutral line and a ground line and equipment is considered to be a continuous load ✓ Conductors should be sized to support 125% of the rated equipment load (NEC 625.21) ✓ Preparing mounting surface and install per equipment manufacturer instructions ✓ Floor-mount: typically requires a concrete foundation with J-bolts on station base; place with space to allow conductors to enter through the base ✓ Wall/pole/ceiling-mount: install brackets for mounting of the equipment ✓ Install bollard(s) and/or wheel stop(s) as needed ✓ Install informative signage to identify the EVSE and potential trip hazards ✓ Install additional electrical panels or subpanels as needed ✓ 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 ✓ Make electrical connection ✓ Perform finish work to repair existing infrastructure, surfaces and landscaping | |

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| Phase 6 Inspection | <ul style="list-style-type: none"> ✓ 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 ✓ 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 ✓ Contractor should verify EVSE functionality |
| Additional Resources | <ul style="list-style-type: none"> ✓ National Codes and Standards ✓ American National Standards Institute (ANSI) ✓ National Fire Protection Association (NFPA) ✓ Underwriters Laboratories, Inc. (UL) ✓ International Association of Electrical Inspectors (IAEI) ✓ International Code Council (ICC) ✓ NECA-NEIS Standards ✓ NECA and NFPA Webinars ✓ Electrical Vehicle Infrastructure Training Program (EVITP) Installer Training Course/Certification |