

SAFETY REQUIREMENTS CHECKLIST FOR CPUC-APPROVED TRANSPORTATION ELECTRIFICATION PROGRAMS

[Note: Each sponsoring utility must ensure that the following Pre-construction, Construction, and Operational standards are met and report on their compliance at quarterly Program Advisory Council meetings. These requirements are the minimum safety precautions the utilities should meet.]

Terminology Defined¹

Acronym	Definition
EV	Electric Vehicle
UL	Underwriters Laboratory
EVSE	Electric Vehicle Supply Equipment safely connects the AC electricity grid at a site to the EV. Sometimes used more broadly to refer to the charging equipment, not including the make-ready infrastructure or other charging infrastructure. May include multiple connectors to charge several EVs or to serve EVs with different types of connectors (e.g. SAE CCS and CHAdeMO)
SAE	Society of Automotive Engineers
ADA	Americans with Disabilities Act
AHJ	Authority Having Jurisdiction, as defined by Article 100 of the 2017 National Electric Code: An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure. ²
J-1772 Standard	An SAE standard for electrical and

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D.18-01-024/D.18-05-040

	physical interface to facilitate a safe connections from the EVSE for conductive charging.
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¹ See D.18-01-024 at Appendix A.

² 2017 NEC Article 100, Definitions, includes an informational note regarding AHJ: “The phrase ‘authority having jurisdiction’ or its acronym AHJ, is used in National Fire Protection Association (NFPA) documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.”

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Level 1 Charging	Charging via AC electrical connection at 120 volts and up to 16 amps, or 1.9 kW.
Level 2 Charging	Charging via AC electrical connection at 208 volts or 240 volts at up to 80 amps.
DC Fast Charging	Charging via DC electrical connection using off-board AC/DC equipment at a fast rate. Not all EVs have this connector.
CHAdeMO and/or CCS Charging Connector Standards	There are three types of standard charging connectors for Direct Current Fast Charging. Vehicles capable of DC fast charging will have one of these ports on the vehicle. Other nonstandard connectors include Tesla and BYD. Most public DCFC currently deployed in California includes standard CHAdeMO and/or CCS Type 1 charging connectors.
IOU(s)	Investor Owned Utility(ies)
EVITP Training	The Electric Vehicle Infrastructure Training Program provides electricians with training for the installation of EVSE. EVITP is a collaboration of industry stakeholders, including automakers, EVSE manufacturers, educational institutions, utility companies, and electric industry professionals. More information is available at https://evitp.org .
NRTL	Nationally Recognized Testing Lab

Pre-construction: These EV charging equipment safety requirements must be specified in procurement documents:

1. Charging equipment must be certified by a Nationally Recognized Testing Lab (NRTL).
2. Infrastructure must comply with applicable safety performance requirements associated with the type of TE infrastructure being installed.
 - For light-duty vehicles, compliance with the Society of Automotive Engineers (SAE) J-1772 Standard for Level 1 or Level 2 charging. Compliance with CHAdeMO and CCS for DC fast charging would be appropriate evidence of compliance with this requirement.
 - For other types of TE infrastructure, including any non-standardized EVSE, the following basic connector safety measures will be required:
 - A passing EVSE safety performance evaluation report performed by a Nationally Recognized Testing Lab (NRTL);
 - When not connected, the vehicle inlet and the EVSE connector must be designed to prevent direct contact with any live components;
 - The vehicle inlet and EVSE connector shall be free of sharp edges and potentially injurious protrusions;
 - The coupler between the vehicle and the EVSE should avoid or mitigate any potentially hazardous conditions such as fires, electrical shock to users, or other personal injuries.
3. Infrastructure and its planned installation must comply with California Electrical Code Article 625.²
4. Infrastructure and its planned installation must comply with the Americans with Disabilities Act (ADA), 42 U.S.C. § 12101 et seq., and California Building Code Chapter 11B,³ if applicable, per the AHJ where the EVSE will be installed, unless the appropriate waiver is obtained from local authorities.

² California Electrical Code Article 625 covers Electric Vehicle Charging System safety and standards as installed in place. California Code of Regulations, Title 24, Article 625.

³ California Building Code Chapter 2 includes definition associated with electric vehicle charging stations. CBC Chapter 11B defines requirements for 'Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.'

5. Outdoor-mounted EVSE must be rated to be installed for outdoor use.
6. For utility infrastructure work on the customer side of the meter, contractors must provide proof of EVITP Certification prior to construction.
7. Contractors must provide the utility proof of a full site assessment, including the appropriate load calculations to ensure existing infrastructure can accommodate additional EV load, or that appropriate infrastructure upgrades will be completed.

During Construction:

1. All utility infrastructure work on the customer side of the meter not performed by employees of the IOUs shall be performed by fully licensed electricians. For commercial installations, all electrical contractors should hold a valid C-10 contractor's license.
2. Installations will be designed per Article 625 of the California Electrical Code.

Operational Safety:

1. Overcurrent protection associated with utility transformers and distribution circuits that feed power to the charging stations.
2. Overcurrent protection in the meter pedestal/circuit breaker panel that feeds each of the charging stations.
3. Bollard equipment protection installed where appropriate as defined by utility design standards and AHJ requirements.
4. Concrete parking stops to protect equipment where appropriate as defined by utility design standards and AHJ requirements.