

ELECTRICAL VEHICLE CHARGING STATION

BACKGROUND

An Electrical Vehicle (EV) charging station or Electric Vehicle Supply Equipment (EVSE) is an electrical power source for plug-in vehicles. They are commonly found at retail buildings, office buildings, and all types of parking facilities, and even at some co-ops, condos, and apartment buildings. EV charging stations offer a convenient solution, but lack of maintenance can result in safety hazards such as electrical fires, electric shocks, and damage to the vehicle's battery.



THREE TYPES OF CHARGING STATIONS:

- **Level 1**
 - Common 120-volt household outlet
 - All electric cars come with a cable that can be plugged into a standard wall outlet with no equipment installation required.
 - Level 1 charging is ideal for plug in hybrid electric cars that have smaller batteries, but it can suffice for some fully battery electric car owners as well depending on their daily range needs and length of time typically parked and charging.
- **Level 2**
 - Most commonly used for daily EV charging
 - Charging station installation requires a dedicated 240-volt or 208-volt electrical circuit, similar to what is required for a clothes dryer or electric range/ oven.
 - This type of charging station can be installed at home, workplace, or public locations.
- **Level 3**
 - Fastest way to charge an EV.
 - It requires a 480-volt connection making DC fast charging unsuitable for home use and not every electric car model is equipped for it.
 - Typically, not installed at private residences (homes) because of the power generated and cost to install.



LOCATION OF INSTALLATION:

Considerations should be given depending on the location of the EV charging station. There are various federal, state, and local regulations that could dictate where these should be placed. Be sure to review your specific requirements.

Considerations for installations located externally:

- Distance from building
- Distance from other items (i.e., transformers, generators, other electrical equipment) and external storage of combustible materials (i.e., waste storage areas, flammable liquid, or gas storage), along with vegetation.
- Firefighting access

Considerations for installations located internally, such as within a parking garage:

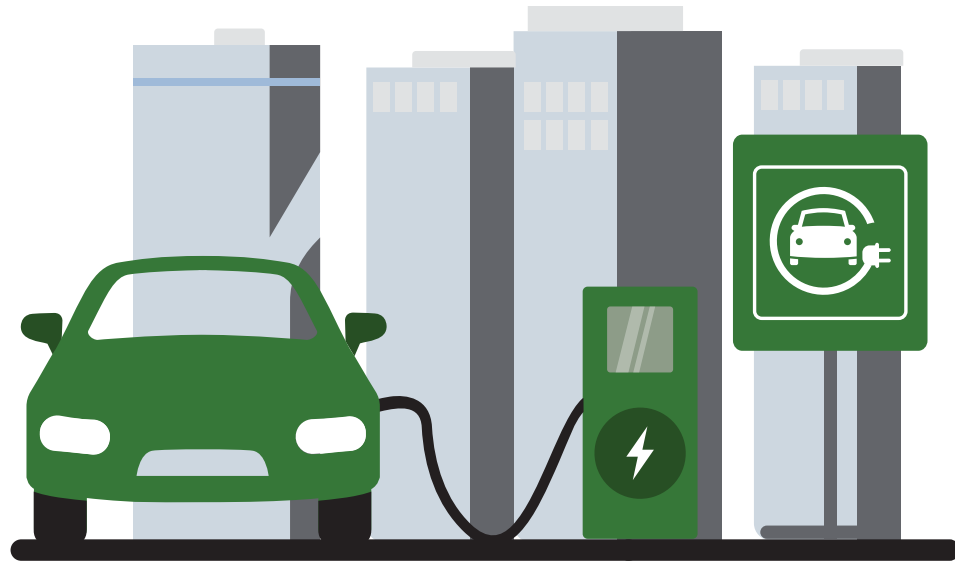
- The charging/parking inlets should be located as close as possible to the external exits, and preferably at ground level, to allow easy access for the fire department, and to assist with the removal of the vehicle(s) in the event of a fire.
- The construction of the building/parking garage area should be assessed to determine proper fire rating and fire protection needed, should the charging station require it.

REFERENCES & RESOURCES

[The big list of EV charging regulations and standards \(chargelab.co\)](https://chargelab.co)

[Alternative Fuels Data Center: Federal and State Laws and Incentives \(energy.gov\)](https://energy.gov)

[Alternative Fuels Data Center: Electric Vehicle Charging Stations \(energy.gov\)](https://energy.gov)



MAINTENANCE REQUIREMENTS:

Owners must work with manufacturers to establish a service program ahead of installation. The maintenance required will vary based on charger type, location, and anticipated frequency of use.

Level 1 & 2 charging stations tend to require less maintenance. The units should be kept clean by wiping them down with a damp cloth, and any accessible parts need to be checked for basic wear and tear. This should be conducted monthly and documented as part of the ongoing maintenance record.

Level 3 charging stations will require more maintenance due to the increased charging capabilities. They require filters, cooling systems, and other advanced parts to function properly. A reputable servicing technician should complete routine and required maintenance, including regular system inspections.

Below is a system inspection process that a typical service technician may follow:

- **Visual Inspection** - A service technician will inspect the charging station(s) to ensure that all system components are clean and functioning within designed specifications.
- **Environment Inspection** - A service technician will verify and document that the system's environment is within specified operating conditions.
- **Mechanical/Electrical Inspection** - Inspection of the charging connections and operational control. The service technician will verify and implement all required field advisories and field modifications.
- **Prepare and Deliver Report** - A detailed report will be provided, describing the current condition and make recommendations for corrective action if required.

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