

Electric Vehicle Supply Equipment Installers and Inspectors

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DOE EV Planning Grant

- TCI, together with NYSERDA and 16 of the region's Clean Cities Coalitions, received a nearly \$1 million Electric Vehicle Readiness Grant from DOE in September 2011 to lay the groundwork for the Northeast Electric Vehicle Network.
 - Engaging stakeholders
 - Conducting a literature review of market barriers to EV deployment
 - Creating siting and design guidelines, model permits, building codes, and ordinances tailored to the TCI region
 - Undertaking education and outreach activities to raise awareness of the benefits of EVs and share the products of this work

- Consulting team Energetics Incorporated and WXY Architecture + Urban Design is creating a series of EV guidance documents for the TCI region. These documents include:
 - A report on **EV-Ready Codes for the Built Environment**;
 - **Siting and Design Guidelines for Electric Vehicle Supply Equipment**;
 - A Guide to Planning and Policy Tools for creating EV-Ready towns and cities;
 - An Analysis of Current EV and EVSE Deployment in the TCI region; and
 - An EVSE Cluster Analysis.





EV-Ready Codes

- An overview of building and electrical codes and their relation to EVs, highlights best practices from around the country, and makes recommendations for jurisdictions in the Northeast and Mid-Atlantic. The report draws several conclusions:
 - Existing codes do not present a significant barrier to EVSE deployment, but there is room within the codes to more clearly encourage EV-readiness;
 - Codes can create a high-level planning framework while retaining flexibility at the local level; and
 - Adopting EV-friendly codes should be part of a collaboration between partners to create a comprehensive EVSE deployment strategy.



Siting and Design Guidelines

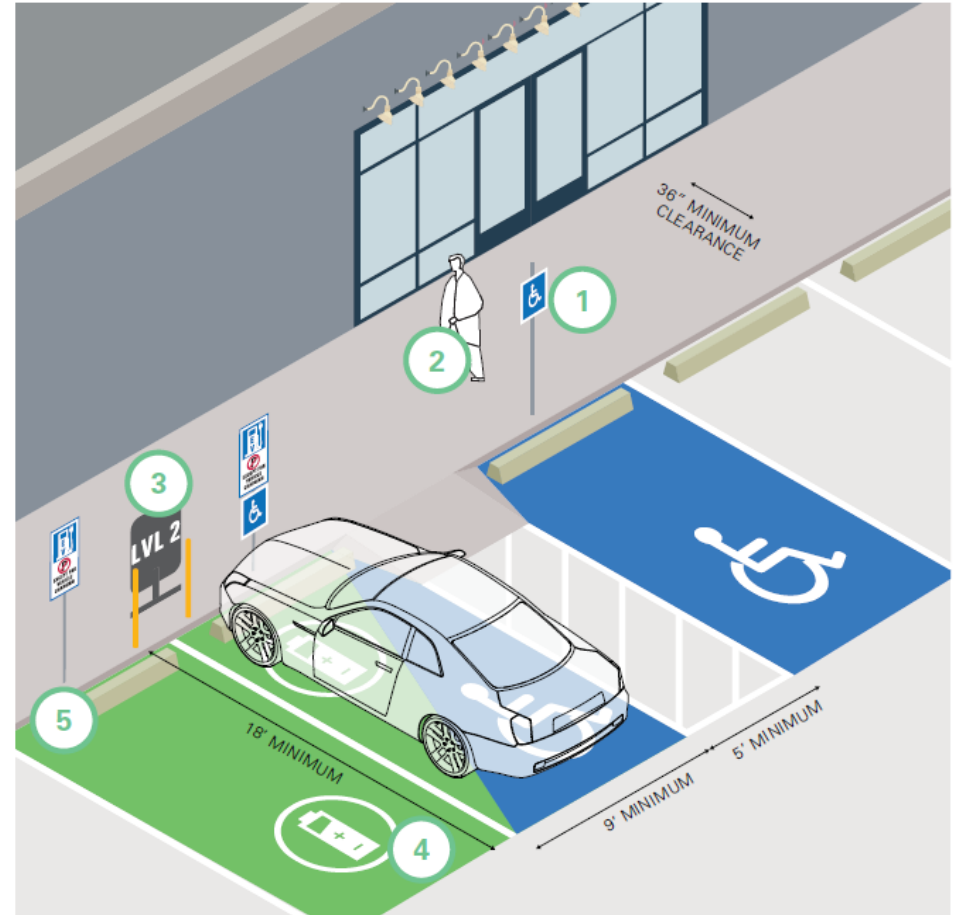
- The guidelines provide siting and design recommendations at the micro level. Specifically, these guidelines:
 - Identify key siting and design issues that are relevant to local governments, developers, homeowners, businesses, utility providers, and other organizations; and
 - Provide an overview of elements of site selection and design and installation scenarios. This guide is for installers involved in installing EVSE at commercial lots, multi-family residences, on-street charging, service station models, and fleets.



Commercial Lot

Siting and Design Guidelines

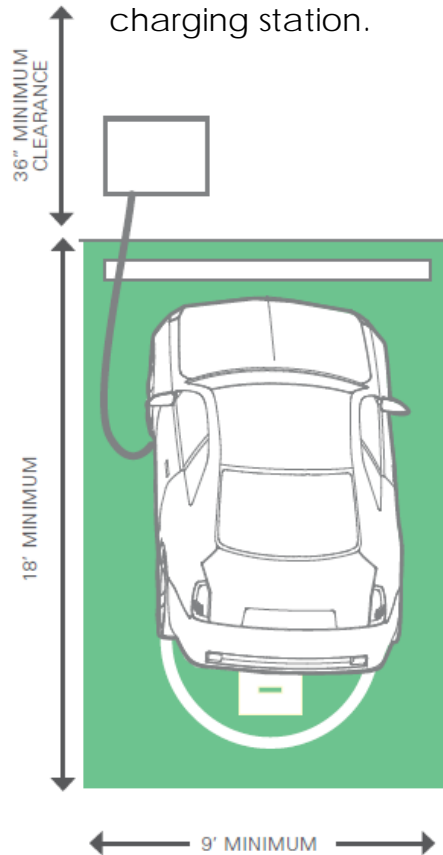
- Guidelines for commercial sites
 - Signage is critical for finding stations in a busy lot.
 - Allow sufficient room for access pedestrian access, and keep path clear for pedestrians.
 - Visible EVSE can help with green branding.
 - Carefully site EVSE to minimize cost; may be most cost effective to locate EVSE near electrical panel.



Siting and Design Guidelines

Standard Parking Space Considerations:

More than typical space is required in order to ensure safe and easy movement around the charging station.



Parking Space Considerations for Wheelchair Accessibility:

The ground surface should be firm, level, and have a slope no more than 2% in any direction.

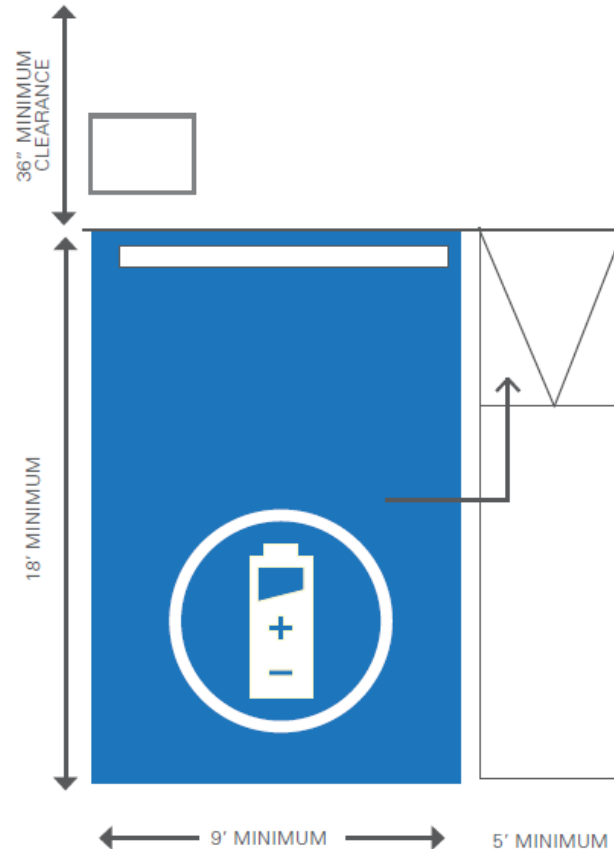
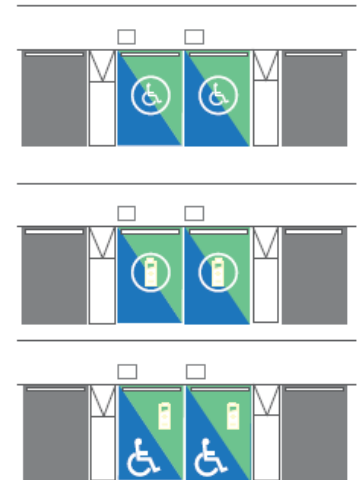


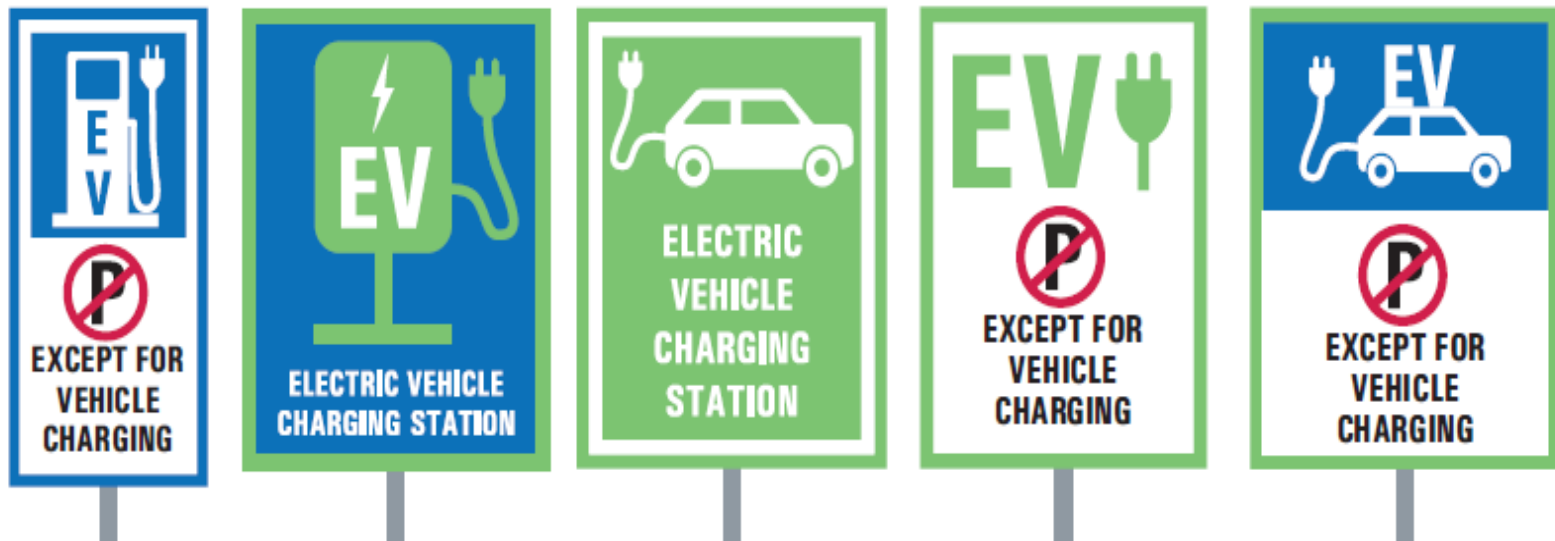
FIGURE 7.
POSSIBLE VARIATIONS FOR
WHEELCHAIR ACCESSIBLE EVSE
CHARGING SPACES



Siting and Design Guidelines

● Signage and Wayfinding

- USDOT's Manual of Uniform Traffic Control Devices
- A combination of symbol and text is recommended. The term "charging" should be used to ensure hybrid vehicles do not use the spaces for parking. The selected EV symbol should be larger and more pronounced than the no-parking symbol to avoid confusing messages.





Electric Vehicle Infrastructure Training Program (EVITP)





What/Who is EVITP?

A not-for-profit, volunteer, EV industry collaborative training program that addresses the technical requirements, safety imperatives, and performance integrity of industry partners and stakeholders including:

Automobile Manufacturers
Investor-Owned and Municipal Utilities
Electric Vehicle Supply Equipment Manufacturers
Electrical Energy Storage Device Manufacturers
State and Local Electrical Inspectors
Electrical Contractors
Electrical Workers
First Responders



Electric Vehicle Infrastructure Training Program (EVITP) Technical Training

A structured platform for delivering training and certification for the installation of Electric Vehicle Supply Equipment (EVSE's) in and around Residential, Commercial & Public Facilities.



Master Instructor Qualifications

Instructors for the Electric Vehicle Infrastructure Training Program (EVITP) are required to meet or exceed the following minimum eligibility criteria:

Must be a state licensed or certified commercial/industrial electrician, master electrician, or electrical administrator

Or a state licensed or registered Professional Electrical Engineer

Or an IAEI certified Electrical Inspector, ***And ...***

Must have a minimum of five years of experience providing instruction at the Train-the-Trainer level, ***And***

Must have National Training Institute instructor certification or equivalent technical teaching credential, ***And***

Must have adequate time to teach EVITP course material, on an ongoing and regular basis.



Electrician Qualifications

Must be a state licensed or certified commercial/industrial electrician, master electrician, or electrical administrator.

State *licensed* Electricians (journeymen inside wiremen) who have completed a state or federally approved electrical apprenticeship program with a minimum of 8,000 hours of On-the-Job training and 720 hours of related classroom and laboratory instruction.

State *certified* Electricians (journeymen inside wiremen) who have completed a state or federally approved electrical apprenticeship program with a minimum of 8,000 hours of On-the-Job training and 720 hours of related classroom and laboratory instruction.



EVITP Course Description

Phase One Training:

This 24 hour class comprehensively addresses the requirements, regulations, products and strategies which will enable electrical contractors and electricians to master successful, expert, and professional customer relations, installation, and maintenance of Electric Vehicle (EV) and Plug-in Hybrid Electric Vehicle (PHEV) infrastructure.



EVITP Phase One Class Outline

- Overview of Electric Vehicles
- Types of Electric Vehicles – Present & Future
- Electric Vehicle Manufacturers and Products
- Electric Vehicle Charging Unit Manufacturers and Products
- Utility Policy, Notification and Integration
- Electric Vehicle Rules and Regulations
- Electric Vehicle Charging Site Assessment
- Electric Vehicle Charging Stations and Charging Load Requirements



EVITP Phase One Class Outline (cont.)

- Code Officials and Inspection
- Electrical Codes, Electrical Safety Requirements, Other Regulations and Standards
- Electric Charging Installation
- Renewable Energy and Electric Vehicles
- First Responders
- Customer Relations – Contractor's Role/Electricians Role
- Field Installation Practicum (Lab)
- EV Certification Lab and Written Exams



EVITP Phase Two Fleet and Commercial Training Segments

- Troubleshooting and Repair of EVSE
- Wireless Energy Transfer
- 480 Volt Connected Fast Charging
- Facility Based Energy Storage



Why is EVITP Training Important?

- Not Just a Dryer Outlet
- History Lesson and Cautionary Tale – Solar Thermal
- Enables contractors and electricians to deliver quality, performance, and safety
- Provides Decision Makers with a Credential to Identify Properly Qualified Installers
- Provides Residential and Commercial Customers with the safest and best return on their investment (ROI)
- Enhances Customer Satisfaction with Electric Vehicles



<http://www1.eere.energy.gov/cleancities/evitp.html>

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Goals & Accomplishments

Partnerships

- National Clean Fleets Partnership
- National Parks Initiative
- Electric Vehicle Infrastructure Training Program**
- EcoCAR Challenge
- AAA Greenlight Partnership
- Natural Gas Transit & School Bus Users Group
- Natural Gas Vehicle Technology Forum
- Hall of Fame
- Contacts

Electric Vehicle Infrastructure Training Program

The Electric Vehicle Infrastructure Training Program (EVITP) provides training and certification for people installing electric vehicle supply equipment (EVSE). As a voluntary collaboration of electrical industry organizations, EVITP supports developing electric vehicle (EV) charging infrastructure for residential and commercial markets.

Clean Cities works with EVITP to address technical requirements, safety imperatives, and training needs for electric vehicle industry partners and stakeholders.


Training Opportunities

The Electric Vehicle Infrastructure Training Program offers training around the United States at community colleges and electrical training centers. Training is open to licensed electricians in compliance with requirements of state or municipal jurisdictions. Training on local requirements supplements core training when appropriate.

Focused Curriculum

EVITP collaborates with industry organizations to develop curriculum to train and certify electricians. This training teaches industry best practices in electric vehicle infrastructure installation, commissioning, and maintenance.

Electric Vehicle
EVITP
Infrastructure Training Program

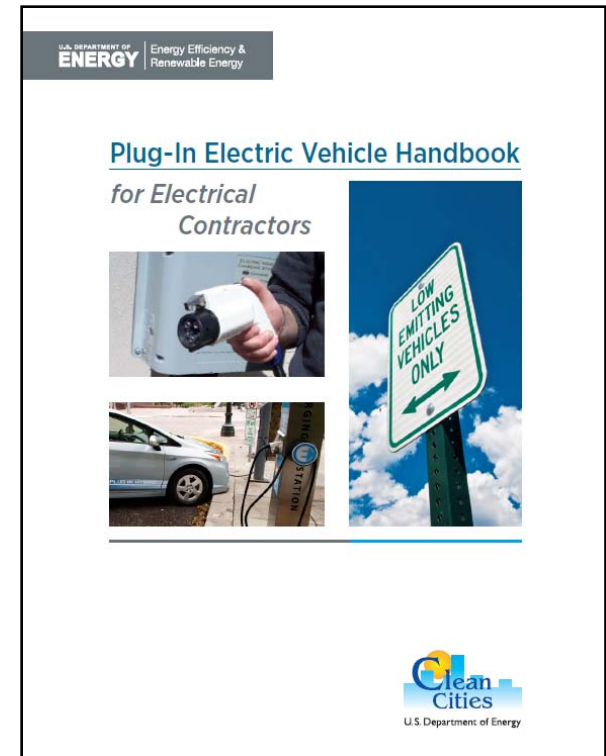


Or Google “EVITP - Clean Cities”

Plug-in Electric Vehicle Handbook for Electrical Contractors

- Designed to answer basic questions about PEVs and charging infrastructure
 - Introduction
 - PEV Basics
 - Charging Basics
 - Installing and Maintaining EVSE
 - EVSE Training for Electrical Contractors
 - Electrifying the Future

www.afdc.energy.gov/pdfs/51228.pdf



- Training: EVSE Residential Charging Installation
 - Clean Cities TV (YouTube)

Training for Installing Residential Electric Vehicle Supply Equipment (33:35)

4: National Electric Code for Electric Vehicle Supply Equipment Installation (7:06)

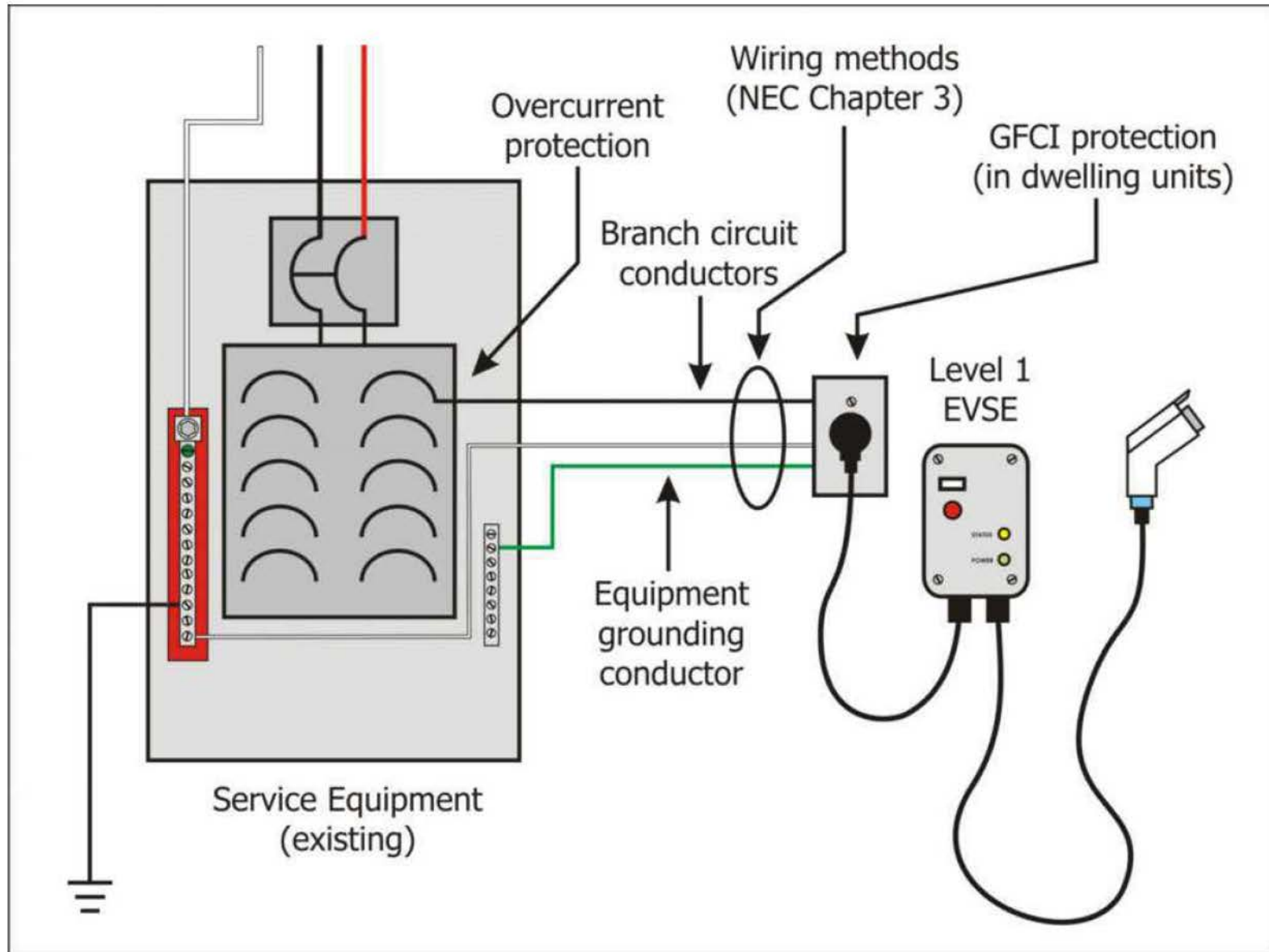
5: Installation of Electric Vehicle Supply Equipment (9:33)

6: Inspection of Electric Vehicle Supply Equipment (1:36)

7: Best Practices for Installing Electric Vehicle Supply Equipment (2:15)

- EV charging that employs cord-and-plug connected portable EVSE that is transported with and used specifically for an EV.
- AC Level 1 EVSE is rated single-phase, nominal 120 VAC, 16 A maximum, and is suitable for connection to NEMA 5-15R or 5-20R receptacles.
- GFCI (ground fault circuit interrupter) protection is required for 125-V, 15- and 20-ampere receptacles installed at dwelling garages and outdoor locations.
- NECA recommends installing an individual branch circuit for all EVSE, including level 1.

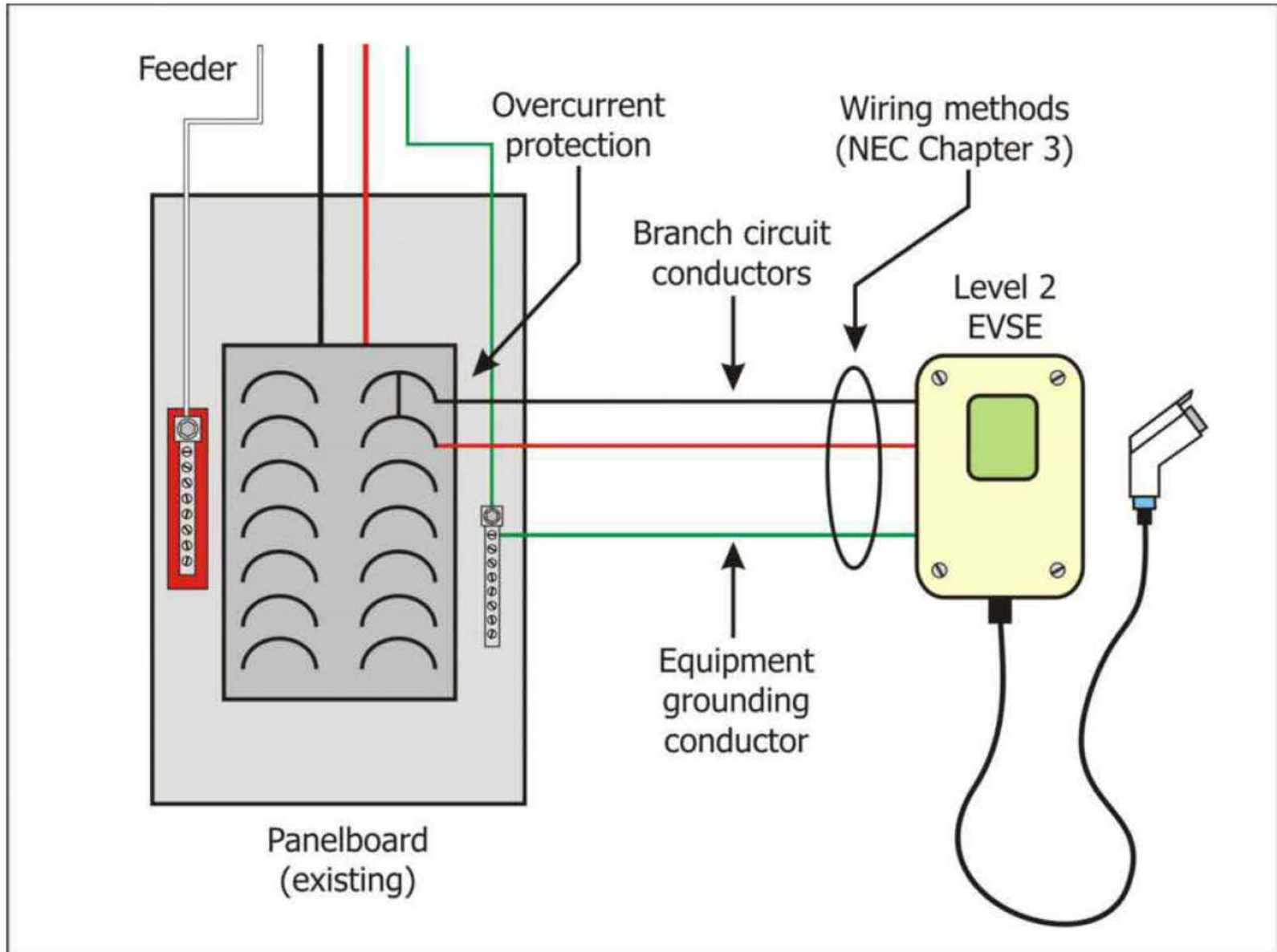




- EV charging that employs permanently wired EVSE that is operated at a fixed location and used specifically for EV charging.
- Level 2 EVSE is rated single-phase, nominal 208 VAC or 240 VAC, 80 A maximum, wired directly to an individual branch circuit with over-current protection as required.
- Level 2 power is approximately 3300 watts, typically requiring a one-time investment to upgrade the garage with an individual (dedicated) branch circuit 240V circuit.
- Capacity of the existing power system must be verified through an accurate site assessment.



AC Level 2



EV Supply Cables

- Flexible cord supply cables must contain the Type Letters: EV
- Other types must be listed as suitable for the purpose
- Length shall not exceed 25 feet unless a listed cable management system is installed

