

Vermont’s 2024 Energy Code: Electric Vehicle Supply Equipment (EVSE) Requirements

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Overview

This resource provides a summary of the Vermont 2024 Commercial and Residential Building Energy Standards (CBES and RBES) requirements for Electric Vehicle Supply Equipment (EVSE, often referred to as “charging equipment”) for various types of buildings.

The updated 2024 requirements include significant increases to EVSE requirements and apply to building construction with new parking facilities starting July 1, 2024.

Plug-in electric vehicles (EVs) including all-electric vehicles (AEVs) and plug-in hybrid electric vehicles (PHEVs) require EVSE to charge and providing the necessary infrastructure to deploy charging during the initial construction process is typically much more cost-effective than retrofitting at a future date.

Types of Electric Vehicle Supply Equipment

Level 1: Level 1 EVSE provides charging through a common residential 120-volt (120V) AC outlet, typically using portable charging equipment supplied by the vehicle manufacturer. Level 1 chargers can take 40-50+ hours to charge a long-range AEV, while most PHEVs can charge in 7-8 due to their smaller batteries.

Level 2: Level 2 EVSE offers higher-powered AC charging through 208-240V electrical service, and is common for home, workplace, and public charging. Level 2 typically charge AEVs in 4-10 hours, or PHEVs in 2-3 hours.

DC Fast Charging (DCFC or “Level 3”): Direct current fast charging (DCFC) equipment offers rapid charging, generally going from 0 to 80 percent state of charge in 30 minutes to an hour. *Most PHEVs currently on the market do not work with fast chargers.* The CBES defines DCFC as “an EVSE equipped with a direct-current (DC) plug for electric vehicle charging with either a CHAdeMO or SAE combined charging system (CCS) format connector, within 5 feet of the centerline for each EV charging parking space. Other DC fast charging plug standards may be accepted as they are developed.” (2024 CBES C202 General Definitions)

The Commercial Building Energy Standards (CBES) requirements cover commercial properties and multifamily buildings with 4 or more stories.

The Residential Building Energy Standards (RBES) requirements cover single family and multifamily buildings with 3 stories or less.



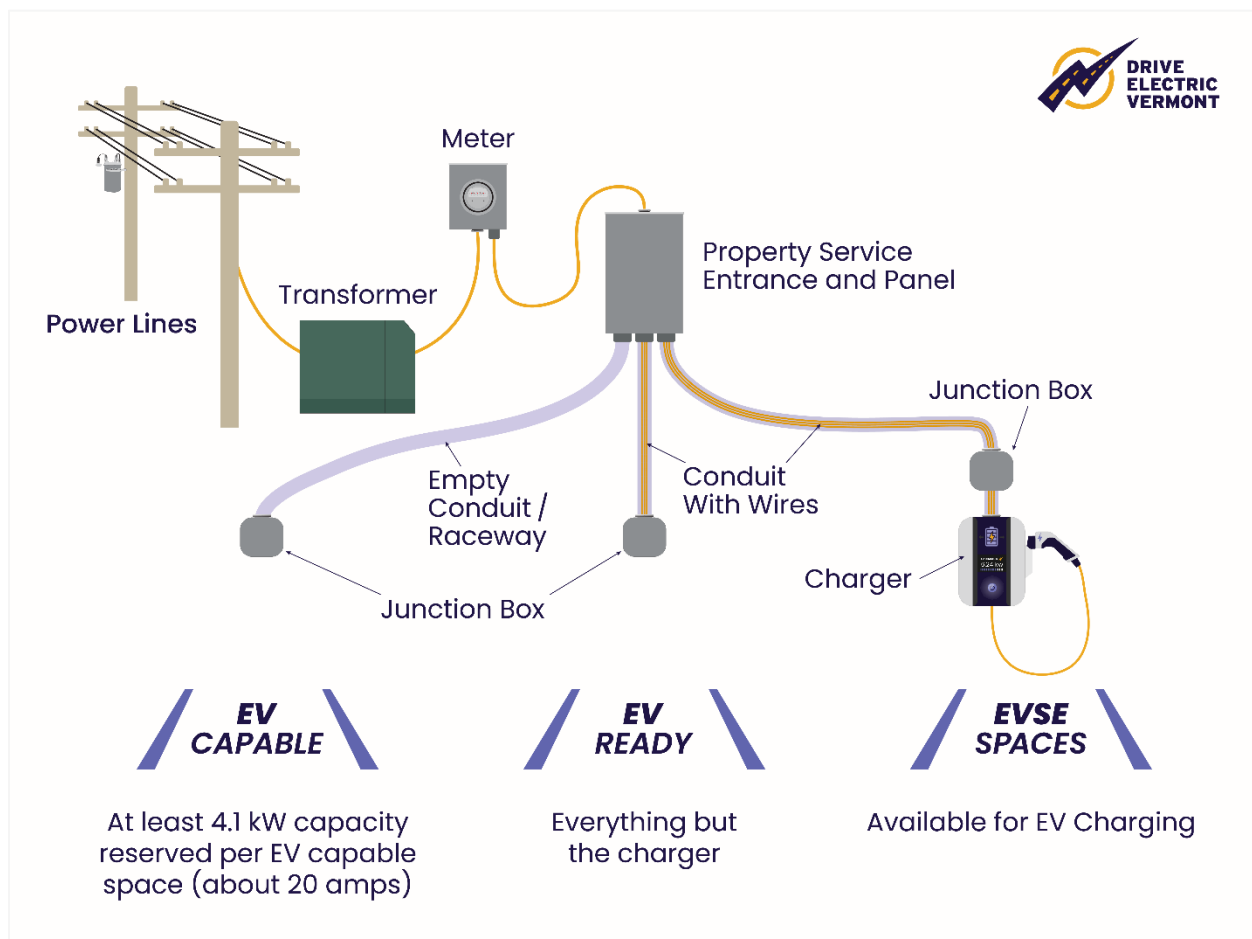
Additional information and the full text of the RBES and CBES is available from the Vermont Department of Public Service at:

<https://publicservice.vermont.gov/efficiency/building-energy-standards>

Electric Vehicle Parking Space Definitions

Figure 1 below illustrates the different types of EV parking spaces defined in the RBES and CBES, including EV Capable, EV Ready, and EVSE spaces. These terms denote varying levels of readiness for EVSE installation ranging from putting empty conduit in place to operational charging equipment. Additional details on these classifications are included in the definitions below.

Figure 1. Types of EV Parking Spaces Defined in the Commercial Building Energy Code



Helpful Terms to Know

Branch Circuit: A branch circuit is part of the electrical system that originates at the main service panel and feeds electricity throughout the structure. There are 120-volt branch circuits that supply power to standard outlets and fixtures, along with 240-volt circuits that power major appliances.

Two-Pole Circuit Breaker: Two pole breakers are made of two single-pole breakers attached with one trip mechanism. Two pole breakers protect two wires and typically supply electricity for large, 240-volt appliances, such as clothes dryers and water heaters. Ratings for double pole breakers can range from 15-200 amps.

Energy Standards Parking Definitions

The definitions below are taken from section C405.13 of the CBES. Table 1 below details the required number of each of these types of spaces for different types of commercial properties. Figure 1 above illustrates each of the types of parking spaces.

EV Capable (C405.13.2): A designated automobile parking space that is provided with all the requisite infrastructure in place within five feet to allow installation of electrical wiring and connection to power for EVSE.

Each EV capable space shall comply with all the following:

- A continuous raceway or cable assembly that is installed between an enclosure or outlet located within 3 feet of the EV capable space and a suitable panelboard or other onsite electrical distribution equipment.
- Installed raceway or cable assembly will be sized and rated to supply a minimum circuit capacity in accordance with Table 1.
- The electrical distribution equipment to which the raceway or cable assembly connects will have sufficient dedicated space and spare electrical capacity for a 2-pole circuit.
- The electrical enclosure or outlet and the electrical distribution equipment directory shall be marked: "For EVSE"
- Reserved capacity shall be no less than 4.1 kVA (kVA is 1,000-volt amps) for each EV capable space.
- Exceptions: R-2 Occupancies (*Primarily Residential Use Occupancies*) with Multifamily building garage or covered parking, should provide on electrical drawings the appropriate sized pathway to the building electrical room to accommodate a future electrical upgrade for Level 2 EVSE electric vehicle charging; provide adequate wall and floor space in the building electrical room for future EV charging related electrical equipment; provide the appropriate sized pathways to exterior on-grade surface parking spaces for future Level 2 EVSE electric vehicle charging; provide a line diagram on the electrical drawings demonstrating a pathway for future Level 2 EVSE electric vehicle charging.

EV Ready Spaces (C405.13.3): An automobile parking space that is provided with a branch circuit and either an outlet, junction box or receptacle, that will support an installed EVSE.

Each branch circuit serving EV ready spaces complies with all the following:

- Terminate at an outlet or enclosure, located within 3 feet of each EV ready space it serves.
- Has a minimum circuit capacity in accordance with Table 1.

- The panelboard or other electrical distribution equipment directory will designate the branch circuit as "For EVSE" and the outlet or enclosure shall be marked "For EVSE."

EVSE Spaces (C405.13.4): An installed EVSE with multiple output connections shall be permitted to serve multiple EVSE spaces. Each EVSE installed to meet the requirements of Section C405.13.1, serving either a single EVSE space or multiple EVSE spaces, shall comply with all of the following:

- Have a minimum circuit capacity in accordance with C405.13.5.
- Have a minimum charging rate in accordance with C405.13.4.1.
- Be located within 3 feet (914 mm) of each EVSE space it serves.
- Be installed in accordance with Section C405.13.6.

Commercial Building Energy Standards EVSE Provisions

EV Power Transfer Infrastructure (Section C405.13)

The number of required **EVSE spaces**, **EV capable spaces** and **EV ready spaces** is determined based on the information in Table 1 below which provides requirements for each type of space based on the total number of automobile parking spaces and should be rounded up to the nearest whole number¹. Supplemental guidance in the CBES may modify these requirements in some locations.

- If there is more than one parking facility provided on a building site, the number of required automobile parking spaces required to have EV power transfer infrastructure will be calculated separately for each parking facility.
- If there is one shared parking facility serving multiple building occupancies, the required number of spaces will be determined proportionally based on the floor area of each building occupancy.
- Each installed EVSE space with an **EV fast charger** will count as four (4) EVSE spaces in Table 1.
- Installed EVSE spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV ready spaces and EV capable spaces.
- Installed EV ready spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV capable spaces.
- The quantity will never exceed the number of automobile parking spaces or require more automobile parking spaces to be constructed.

¹ See Section C405.10

CBES EVSE Exceptions

The following location types are exempt from the 2024 CBES EVSE requirements:

- Parking facilities, serving occupancies other than R-2 with fewer than 10 automobile parking spaces.
- Stand-alone retail stores with fewer than 50 spaces are exempt from the requirement to provide EVSE spaces but *are still required to provide **EV Ready** and **EV Capable spaces*** in Table 1 if there are 10 or more automobile parking spaces.
- Motor liquid fuel-dispensing facilities including gas stations.
- Parking spaces are not counted in Table 1 if one of the following conditions apply:
 - Parking spaces intended exclusively for storage of vehicles for retail sale or vehicle service.
 - Parking spaces that are separated from the meter by a public right-of-way.
 - Parking spaces that are limited to parking durations of less than an hour.

Table 1: CBES Required EV Power Transfer Infrastructure

Adapted from CBES 2024 Table C405.13.1 to include building occupancy definitions

Commercial Building Occupancy	Building Definitions	EVSE Spaces	EV Ready Spaces	EV Capable Spaces
Groups A & M	<p>A: Used for gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.</p> <p>M: Used for the display and sale of merchandise, and involves stocks of goods, wares or merchandise.</p>	2%	0%	20%
Group B	Used for office, professional or service-type transactions, including storage or records and accounts.	6%	0%	30%
Group E	Used for by six or more persons at any one time for educational purposes through the 12th grade.	4%	0%	20%
Groups F, H, & S	<p>F: Used for disassembling, fabricating, finishing, manufacturing, packaging, repair, or processing operation that are not classified as Group H or Group S</p> <p>H: Used for manufacturing, processing, generation, or storage of materials that constitute a physical or health hazard</p> <p>S: Used for storage that is not classified as a hazardous occupancy.</p>	2%	0%	10%
Groups I, R-3, & R-4	<p>I: Used for more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised environment and receive custodial care.</p> <p>R-3: Buildings for permanent occupancies that are not R-1, R-2, or R-4.</p> <p>R-4: buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff</p>	3%	0%	10%
Group R-1	Used for hotels, motels and boarding houses.	8%	7%	50%
Group R-2	Buildings with sleeping units or more than two dwelling units where the occupants are primarily permanent. This includes apartments, dormitories, fraternities, and sororities. It also includes vacation timeshares (with more than two units) and convents and monasteries.	0%	0%	$R2EVC = D/SU + 0.25 * (APS - D/SU)$

R2EVC = Total requirement for EV Capable Spaces in R-2 building occupancies. D/SU = Total number of dwelling and sleeping units in the R-2 building. APS = Total number of automobile parking spaces provided.

Residential Building Energy Standards EVSE Provisions

Electric Vehicle Charging (Section R404.3)

For residential properties, one electric vehicle (EV) charging—Level 2 capable parking space or one space with a Level 2 EV charging station is required for each new dwelling unit or the number of parking spaces provided, whichever is less.

Level 2 capable spaces for RBES are similar to the CBES definition illustrated in Figure 1 above, but require at least one 40-amp branch circuit to the garage or exterior of the building to accommodate a future Level 2 EVSE. A conduit or other unobstructed path to easily run a future wire to the parking spot must be in place within 5 feet of the parking space.

Additional parking spaces not utilized by dwelling units also have requirements as shown in Table 2 below.

RBES EVSE Exceptions

The following location types are exempt from the 2024 RBES EVSE requirements:

- Parking spaces intended exclusively for storage of vehicles for retail sale or vehicle service
- Parking spaces that are separated from the meter by a public right-of-way, such as a road
- Parking spaces that are limited to parking durations of less than an hour
- EV-capable spaces are also not required where no other parking spaces are provided.

RBES Multifamily Requirements

For multifamily buildings with 3 stories or less the RBES requirements apply. For a multifamily building garage or covered parking subject to RBES, the builder or designer must:

- Provide on electrical drawings the appropriate size pathway to the building electrical room to accommodate a future electrical upgrade for Level 2 EV charging
- Provide adequate wall and floor space in the building electrical room for future EV charging-related electrical equipment
- Provide the appropriate size pathways to exterior on-grade surface parking spaces for future Level 2 EV charging
- Provide a line diagram on the electrical drawings demonstrating a pathway for future Level 2 EV charging

The quantity of future Level 2 EV charging stations shall be as required by Table 2 below.

Table 2: RBES Required Level 2 Capable EV Charging Parking Spaces

From RBES 2024 Table R404.3

Building / Parking Type	Minimum Required Number of Level 2 Capable EV Charging Parking Spaces
Single Family Home or Multifamily Building with 3 stories or less	1 per dwelling unit or the number of parking spaces provided, whichever is less
Additional Parking Spaces	25% of remaining parking spaces not utilized by dwelling units, or 40 spaces, whichever is less

Additional EVSE Considerations

Fire Code Requirements

EVSE installations must meet Vermont Division of Fire Safety's State Electrical Safety Rules and related permitting requirements².

Federal ADA Accessibility

The U.S. Access Board has developed a technical assistance document, "[Design Recommendations for Accessible Electric Vehicle Charging Stations](#)" that covers the following topics³:

- Designing and installing electric vehicle (EV) charging infrastructure that is accessible to and usable by people with disabilities
- Existing requirements in the Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) that apply to EV charging infrastructure
- Accessibility features for EV charging infrastructure, the associated parking spaces, and payment systems
- Applicability of the recommendations to public and residential locations.

ADA-compliant EV charging stations should be accessible, easy to use, and safe. Key considerations include ensuring adequate space for exiting and entering the vehicle, unobstructed access to the charging station, free movement around the charging station and connection point on the vehicle, clear paths and proximity to building entrances, and appropriate signage.

² [Vermont Division of Fire Safety Codes and Standards](#)

³ [Alternative Fuels Data Center: ADA Compliance for Electric Vehicle Charging Infrastructure \(energy.gov\)](#)