

## Appendix CD – Electric Vehicle Ready Provisions

User note:

### CD101 SCOPE AND GENERAL REQUIREMENTS

Revise as follows:

**CD101.1 Intent.** This code shall regulate the design, and construction of buildings for the effective use and conservation ~~reduction of greenhouse gas emissions and for the efficient production, use and storage~~ of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

*Intent has been modified to include consideration of greenhouse gas emissions as well as both production and storage of energy.*

### CD103 Construction documents

Revise as follows:

14. Location of designated EVSE spaces, EV-Ready spaces, and EV-Capable spaces in parking facilities.

*To assist in enforcement of electric vehicle infrastructure requirements, and to serve as a plan for full installation of EVSE equipment in EV-ready and EV-capable spaces in the future, plans should clearly indicate the intended locations of EV infrastructure.*

### CD202 GENERAL DEFINITIONS

Add new definitions as follows:

**AUTOMATIC LOAD MANAGEMENT SYSTEMS (ALMS).** A control system that allows multiple connected EVSE to share a circuit or panel and automatically reduce power at each charger, reducing the total connected electrical capacity of all EVSE.

**ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

*Definitions for EV and EVSE are mirrored from NEC-2020 to be useful in defining requirements for electric vehicle infrastructure.*

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) SPACE.** A designated parking space with dedicated *electric vehicle supply equipment* capable of supplying not less than 6.2 kW to an *electric vehicle* located within 3 feet (914 mm) of the parking space.

*The charging rate for an EVSE space is set at 6.2 kW. This is equivalent to a 30A/208V EVSE. 30 and 32A chargers are the most common Level 2 chargers and the highest capacity chargers that can be installed on a 40A branch circuit. kW is used as the metric to indicate total power delivered rather than the specific combination of Volts and Amps.*

**EV-CAPABLE SPACE.** A parking space that is provided with conduit that meets the following requirements:

1. The conduit shall be continuous between a junction box or receptacle located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space with sufficient dedicated physical space for a dual-pole, 40-amp breaker
2. The conduit shall be sized and rated to accommodate a 40-amp, 208/240-volt branch circuit and have a minimum nominal trade size of 1 inch
3. The electrical junction box and the electrical panel directory entry for the dedicated space in the electrical panel shall have labels stating “For future *electric vehicle* charging”

**EV-READY SPACE.** A parking space that is provided with dedicated branch circuit that meets the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit,
2. Terminates at a junction box or receptacle located within 3 feet (914 mm) of the parking space, and
3. The electrical panel directory shall designate the branch circuit as “For electric vehicle charging” and the junction box or receptacle shall be labelled “For electric vehicle charging”.

*EV Ready and EV Capable definitions do not include requirements for minimum capacity for the branch circuit. Different levels of capacity are appropriate for different EV charging scenarios (charging at different building types, parking types, residential types, business types, times of day, etc.) as well as different levels of penetration of EV charging spaces in a parking lot. Therefore, capacity requirements are set in the code text itself to allow for consistent use of the definitions while the capacity requirements change to match the specific EVCI requirements of the jurisdiction.*

**Revise table as follows:**

**TABLE C405.12.2 ENERGY USE CATEGORIES**

LOAD CATEGORY	DESCRIPTION OF ENERGY CUSE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers, and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.

Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment, and commercial kitchens.
<u>Electric vehicle charging</u>	<u>Electric vehicle charging loads.</u>
Building operations and other miscellaneous	The remaining loads not included in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.

*Electric Vehicle charging is a transportation load, not a building load, but is often provided through a building electrical service connection. Adding a category for monitoring EV charging separately allows the building load to be measured independently from this non-building load. This will be critical with the wider adoption of Building Performance Standards or other existing building energy use policies as it will allow EV charging to be easily excluded from the building loads for the purposes of regulating actual energy use in buildings.*

**Add new text as follows:**

**CD405.1 Electric vehicle charging infrastructure.** Parking facilities shall be provided with electric vehicle charging infrastructure in accordance with Table C405.14 based on the total number of parking spaces and rounded up to the nearest whole number. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility. The branch circuit serving EV ready spaces shall have a minimum capacity of 1.8 kVA. EVSE, EV ready spaces and EV capable spaces may be counted toward meeting minimum parking requirements. EVSE spaces may be used to meet requirements for EV ready spaces and EV capable spaces. EV ready spaces may be used to meet requirements for EV capable spaces. An ALMS may be used to reduce the total electrical capacity required by EVSE spaces provided that all EVSE spaces are capable of simultaneously charging at a minimum rate of 1.4 kW.

**Exception:** In parking garages, the conduit required for EV capable spaces may be omitted provided the parking garage electrical service has no less than 1.8 kVA of additional reserved capacity per EV capable space.

*The EV charging infrastructure requirements have been tailored to different charging scenarios. EV Ready spaces are utilized in residential occupancies where EV owners are more likely to choose specific EVSEs with features that meet their personal, long-term needs. The minimum capacity of those EV Ready spaces has been set at Level 1 charging in order to maximize access to EV charging:*

- 1. Residential park times are generally much longer which makes Level 1 charging more feasible.*

2. All EVs come with at least a Level 1 charger, eliminating the need for EV owners to invest in additional equipment to charge at their homes.
3. Level 1 charging minimizes the cost of enabling EV charging at a parking space, allowing for the maximization of the number of EV spaces, which maximizes access to charging.

EVSE spaces are required for commercial parking lots where shorter parking times are typical and Level 2 or 3 parking is more appropriate. Additionally, while the car connection side of Level 2 EVSE are standard, the grid connection side is not, so utilizing EVSE rather than EV Ready spaces maximizes the utility of parking spaces in commercial lots that have more transient parking.

This EVCI language is based on the approach used in the electrification reach codes adopted by various California cities. It captures recent developments in the national conversation about the best way to bring EVCI requirements to code in a way that is consistent, understandable, feasible and ensures the societal benefit of the widest penetration of EV charging possible.

The exception is added to allow capacity to be substituted for conduit in parking garages. EVCI retrofits have different cost considerations in parking garages compared to surface parking lots. Parking garage retrofits do not require retrenching, so the conduit in EV capable spaces does not come with the same future avoided costs.

**TABLE CD405.1**  
**ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS**

<b><u>OCCUPANCY</u></b>	<b><u>EVSE SPACES</u></b>	<b><u>EV READY SPACES</u></b>	<b><u>EV CAPABLE SPACES</u></b>
<b><u>Group B Occupancies</u></b>	<b><u>15%</u></b>	<b><u>NA</u></b>	<b><u>40%</u></b>
<b><u>Group M Occupancies</u></b>	<b><u>25%</u></b>	<b><u>NA</u></b>	<b><u>40%</u></b>
<b><u>R-2 Occupancy</u></b>	<b><u>NA</u></b>	<b><u>100%<sup>a</sup></u></b>	<b><u>NA</u></b>
<b><u>All other Occupancies</u></b>	<b><u>10%</u></b>	<b><u>NA</u></b>	<b><u>40%</u></b>

a. Or one EV ready space per dwelling unit.

The percentages in Table C405.14 can be adjusted to tailor the requirements for the specific market needs of a jurisdiction. However, the EV Capable space requirements included for all commercial lots recognizes that future needs for EV charging will be much greater than they are now. EV capable spaces avoid the significant cost of parking lot re-trenching, which is one of the largest single costs of EVCI retrofits but only a minor investment in new construction.