Electric Vehicle Charging Infrastructure Requirements Guide

This handout provides information on meeting electric vehicle (EV) charging infrastructure requirements

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Coquitlam

Future Retrofitting

The EV infrastructure shall be designed such that it is scalable for future retrofitting to provide for energized outlets in 100% of resident parking spaces. To meet this design standard, all infrastructure needed in the electrical room shall be provided, but the implementation will be such that one space per dwelling unit features an energized outlet capable of providing **Level 2** charging or higher.

To ensure all design standards are met, the parking plan or related plan submitted with the **Development Permit** shall show the location of all energized outlets and include the following notes:

- All energized outlets shall be labeled for their intended use for electric vehicle charging;
- How the electric vehicle load will be metered and confirmation that the apportioning of energy costs to persons when charging stations are installed is available;
- Confirmation from an electrical engineer that the EV infrastructure is designed such that it is scalable for future retrofitting to provide for energized outlets in 100% of resident parking spaces; and
  - Where an EV energy management system has been implemented:
    Confirmation from an electrical engineer that the performance standard will be met; and
  - Confirmation from an electrical engineer that communications technology necessary for the function of the energy management system has been provided.

In addition, a letter signed and sealed by an electrical engineer shall be submitted with the **Building Permit** application confirming that the design of the EV charging infrastructure meets **Zoning Bylaw** requirements and the design standards outlined above. Once construction is complete, a letter signed and sealed by an electrical engineer shall be provided confirming that the EV charging infrastructure was installed and meets **Zoning Bylaw** requirements and the design standards outlined above.

Management of EV Charging:

Following are guidelines for the management of the EV charging infrastructure that must be established by the developer:

- Clear delineation of the party responsible for paying for the charging station and its installation and the permission procedures to do so;
- Charging station ownership;
- A means to reconcile common parking area only electricity costs to individual drivers that is consistent with the Utilities Commission Act of BC;
- Billing rules; and
- In cases where an EV energy management system is implemented, charging stations that are compatible with the EV energy management system will be installed and the EV energy management system is installed, managed and maintained. Outlets and the panels are appropriately labelled to avoid conflicting use, as per the electrical code.

For strata developments, the above items must be addressed in the strata bylaws.

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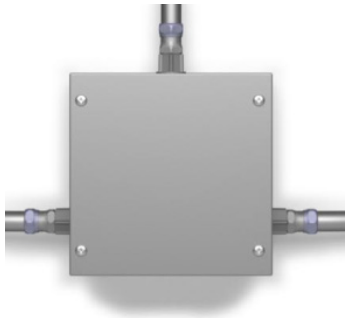
For **apartment**, **townhouse** and **street-oriented village home residential** uses, a minimum of one parking space per dwelling unit shall be equipped with an energized outlet for an EV capable of providing **Level 2 charging or higher**. Where the required number of parking spaces is less than the number of dwelling units, 100% of residential parking spaces shall be equipped with an energized outlet for an EV capable of providing **Level 2** charging or higher. These requirements can be found in **Section 714 of the Zoning Bylaw.**

Energized Outlets

The requirements specify that parking spaces feature an energized outlet capable of providing **Level 2** charging. An energized outlet is defined as a connected point in an electrical wiring installation at which current is taken to supply utilization equipment. **An energized outlet can take the form of an outlet box with a cover or an electric receptacle**. **Level 2** charging means a Level 2 electric vehicle charging level as defined by SAE standard J1772 (OCT2017).



Above: SAE J1772-2009 Electric Vehicle Connector; above right: electrical receptacle; right: Outlet box with cover.

Meeting the Requirements

Dedicated Circuits or **EV Energy Management Systems** may be used to meet the requirements.

1. Dedicated Circuits
A dedicated circuit means an electrical circuit intended to power only one energized outlet.

2. EV Energy Management Systems
EV energy management systems are defined as a system that controls the process of connecting, disconnecting, increasing and reducing electric power to electric vehicle supply equipment (EVSE) loads, and which system may be comprised of one or more monitors, communications equipment, controllers, timers and other applicable devices.

EVSE means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch electric circuit and an EV.

Energy management systems are computer-aided tools that provide for charging station or EVSE control. These technologies allow multiple charging stations to share the current from one circuit, without exceeding the capacity of the circuit. This differs from connecting a charging station to a single dedicated circuit.

Section 714 of the Zoning Bylaw states that where an EV energy management system is implemented, the Director of Development Services may specify a minimum performance standard to ensure a sufficient rate of EV charging; **Table 1** shows the minimum circuit ratings for EV charging infrastructure with energy management to ensure adequate overnight charging in multi-family developments. Performance standards are provided in terms of the number of EVSE per circuit for various circuit ratings to ensure clarity of requirements to avoid misinterpretations and eliminate the necessity for designers to perform complex calculations.

TABLE 1

Number of EVSE per Circuit	Minimum Circuit Breaker Rating (Amps)
1-3	40
4	50
5	60
6	70
7	80
8	90
9	100
10	110
11-12	125
13-15	150
16-19	175
20	200

Performance standards are based on ensuring EVs are fully charged 90% of the time from overnight charging, and sufficiently charged for the subsequent day driving, greater than 99% of the time.

The performance standard (**Table 1**) indicates the maximum number of EVSE that may be connected to the same circuit, for various circuit ratings. Where the feeder ampacity exceeds the rating of the equipment (e.g. 40A EVSE connected to a 100A feeder), a local circuit breaker is required to provide overcurrent protection.

Where an EV energy management system is implemented, communications technology necessary for the function of an EV energy management system, such as cellular, wireless, or cabled infrastructure, must be provided.

Energized Outlet Labels for EV Charging
All energized outlets must be labeled for their intended use for EV charging.

BC Hydro Metering
The EV load should be metered separately from the common house or building load. Energized outlets may be connected to a single BC Hydro meter that is separate from other meters. Alternatively, energized outlets may be connected to a dedicated BC Hydro meter socket for each outlet.