City of Richmond

Bulletin
Engineering Department
6911 No. 3 Road, Richmond, BC V6Y 2C1

www.richmond.ca

Electric Vehicle Charging Infrastructure Requirements – Zoning Bylaw 8500, Section 7.15

No.: ENGINEERING-05
Date: 2018-03-16
Revised: 2018-10-29

Purpose:

To inform owners/applicants, designers and builders of new residences of requirements for residential parking spaces to feature electrical outlets capable of providing "Level 2" electric vehicle (EV) charging (for definition see Section 2.3).

Background:

2.1 Summary of Richmond's EV Charging Infrastructure Requirements

To support access to EV charging at home, Richmond City Council adopted Richmond Zoning Bylaw 8500 Amendment Bylaw No. 9756, on December 18, 2017. The amendment designates:

- For new buildings, structures and uses, each residential parking space, excluding visitor parking spaces, shall feature energized outlets capable of providing "Level 2" EV charging or higher to the parking space.
- Energized outlets be labelled for the intended use for electric vehicle charging.

The Bylaw also specifies that where an EV energy management system is used in multifamily developments, the Director of Engineering may apply performance standards. See Section 3.2.

This requirement applies to new residential buildings, or new residential uses. The requirements are not triggered by a change of use to the non-residential portion of a mixed-use project, unless additional residential units are added to building space that was previously another use.

2.2 Effective Date

The requirements apply to new construction that has not been issued a building permit by April 1, 2018 (the "effective date").

As multifamily developments that are "in-stream" may face greater difficulty adjusting the design of parking areas and/or electrical systems to provide EV charging infrastructure, additional provisions apply to them:

- Multifamily developments that have been issued Development Permits prior to the effective date (April 1, 2018), may apply for a Building Permit to construct in compliance with previous applicable requirements for the duration of the time the Development Permit is valid;
- Multifamily developments that have submitted acceptable Development Permit applications before December 18, 2017 (the date of Council's adoption of the requirements), and were endorsed by the Development Permit Panel before June 18, 2018 (i.e. within 6 months of the date of Council's adoption of the requirement), have until December 15, 2019, to receive a Building Permit in order to build under previous requirements.

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2.3 About “Level 2” EV charging

Richmond Zoning Bylaw 8500 references the SAE International (the Society of Automotive Engineers) J1772 Standard, which defines an “Level 2" charging as per the table below.

Charge Method	Nominal Supply Voltage (V)	Max Current Range (Amps-continuous)
AC Level 2	208 or 240V AC, single phase	From 16A to 80A

2.4 About Energized Outlets

Richmond’s requirements specify that parking spaces feature an energized outlet capable of providing “Level 2” EV charging. An “energized outlet” means a connected point in an electrical wiring installation at which current is taken to supply utilization equipment. It does not refer to “electric vehicle supply equipment” (EVSE – i.e. an EV charging station). Developers and builders are welcome to implement EVSE at parking spaces; however, the City’s minimum requirement is an energized outlet be provided. An energized outlet can take the form of an outlet box with a cover, or an electrical receptacle of an appropriate configuration (see examples below).

Examples: Outlet box with cover; electrical receptacle (6-50R)

Implementation:

3.1 Residential Developments with Private Parking Spaces (Single Family, Duplex, Townhome, etc.)

Residences such as single detached housing, two-unit housing, coach houses, secondary suites, granny flats, and most townhouses, typically feature on-site parking spaces exclusive to a dwelling unit. These parking spaces are typically in a garage, carport, or non-enclosed parking area.

To meet the City’s requirements, **these parking areas must feature energized outlets of 208-240V AC 1-phase, and minimum 32 amp (40 amp branch breaker)**. One outlet can be shared between two, three or four adjacent parking spaces; users will have the option to install a multi-headed charging station to serve multiple vehicles.

In cases where no additional circuits are available for EVSE and dedicating a 40A circuit to the charging infrastructure would lead to an electrical panel upgrade, a “load miser”, “watt miser” or “charge controller” may be used. Such equipment options allow a Level 2 charger to be implemented without exceeding the capacity of a panel or circuit. This does not preclude other EV energy management systems from being used.

In cases where outlets must be installed outside to serve outdoor parking spaces, weatherproof enclosures should be used.

Plans submitted for Development Permit applications and Building Permit applications must indicate an energized outlet at all applicable stalls under this requirement.

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3.2 Multifamily Developments with Shared Parking Areas

Apartments, and some townhouses, typically feature shared parking areas. These parking areas are typically enclosed, though some may be non-enclosed.

Each residential parking stall, excluding visitor parking, must feature an energized outlet capable of providing Level 2 charging. Two strategies may be used to meet the requirements:

1. Dedicated Circuits

   Projects can meet the requirement by providing a dedicated circuit capable of providing Level 2 charging to an outlet at each parking stall at each parking stall. Attachment 1 illustrates such a configuration.

2. EV Energy Management Systems

   "EV energy management systems" refers to a variety of technologies that can control the electrical load associated with charging EVs. These systems are also variously referred to as "load sharing", "load management", "smart charging", etc. Many EV energy management systems for multifamily developments entail multiple EVSE connected to one electrical circuit, with EVSE with communications capabilities able to control their collective load so as not to exceed the capacity of a circuit. Designing for EV energy management systems can reduce the load for which the building electrical systems must be constructed, and thereby lower costs, relative to dedicated circuits. Section 8 of the 2018 edition of the Canadian Electrical Code recognizes the use of "EV energy management systems".

The City of Richmond commissioned a report that profiles a variety of EV energy management system configurations, including commentary on their benefits, limitations, applications, and BC Electrical Code compliance considerations. The report is available here:
www.richmond.ca/__shared/assets/EV_Charging_in_Shared_Parking_Areas_Report51731.pdf

Performance Standard

Per Richmond Zoning Bylaw 8500, Section 7.15.3, the Director of Engineering can establish a performance standard for projects that are designed for EV energy management systems. The performance standard is:

> *The system must be capable of supplying a minimum performance level of 12 kWh per parking space over an eight (8) hour overnight period, assuming that all parking spaces are in use by a charging EV.*
>
> *Projects implementing EV energy management systems must provide for communications technology necessary for the function of an EV energy management system (e.g. cellular, wireless, or cabled infrastructure).*

The intent of the performance standard is to ensure sufficient electricity is available to EV drivers to ensure a reasonable rate of overnight recharging. A variety of electrical infrastructure configurations are capable of meeting this performance standard. One configuration is to provide four (4) or fewer outlets on a 208V 40A circuit (see Attachment 2)[1].

Management of EV Charging

New developments are encouraged to file strata bylaws, and/or establish rules and service contracts, which ensure successful management of EV charging infrastructure.

Guidance on strata bylaws and rules is available in the report linked below:
www.richmond.ca/__shared/assets/EV_Charging_in_Shared_Parking_Areas_Report51731.pdf

Likewise, model bylaws are available from pluginbc.ca: http://pluginbc.ca/resource/strata-bylaw-templates-ev-charging/

See over →

[1] This does not preclude configurations with higher capacity branch circuits and larger numbers of chargers — other configurations may employ higher amperage circuits and share more EVSEs, or they might use dedicated circuits to the EVSEs and overload the panel with an energy management system to limit the use, provided the performance standard is met with an equivalent supply.

BC Hydro Metering

EV load should be metered separately from the “House” (i.e. common area or building) load. Energized outlets may be connected to a single BC Hydro meter that is separate from other meters. Alternately, energized outlets must be connected to a dedicated BCH meter sockets for each outlet.

Development and Building Permit Application Requirements

Plans submitted for Development Permit applications and Building Permit applications must indicate an energized outlet at all applicable stalls under this requirement.

City Contact

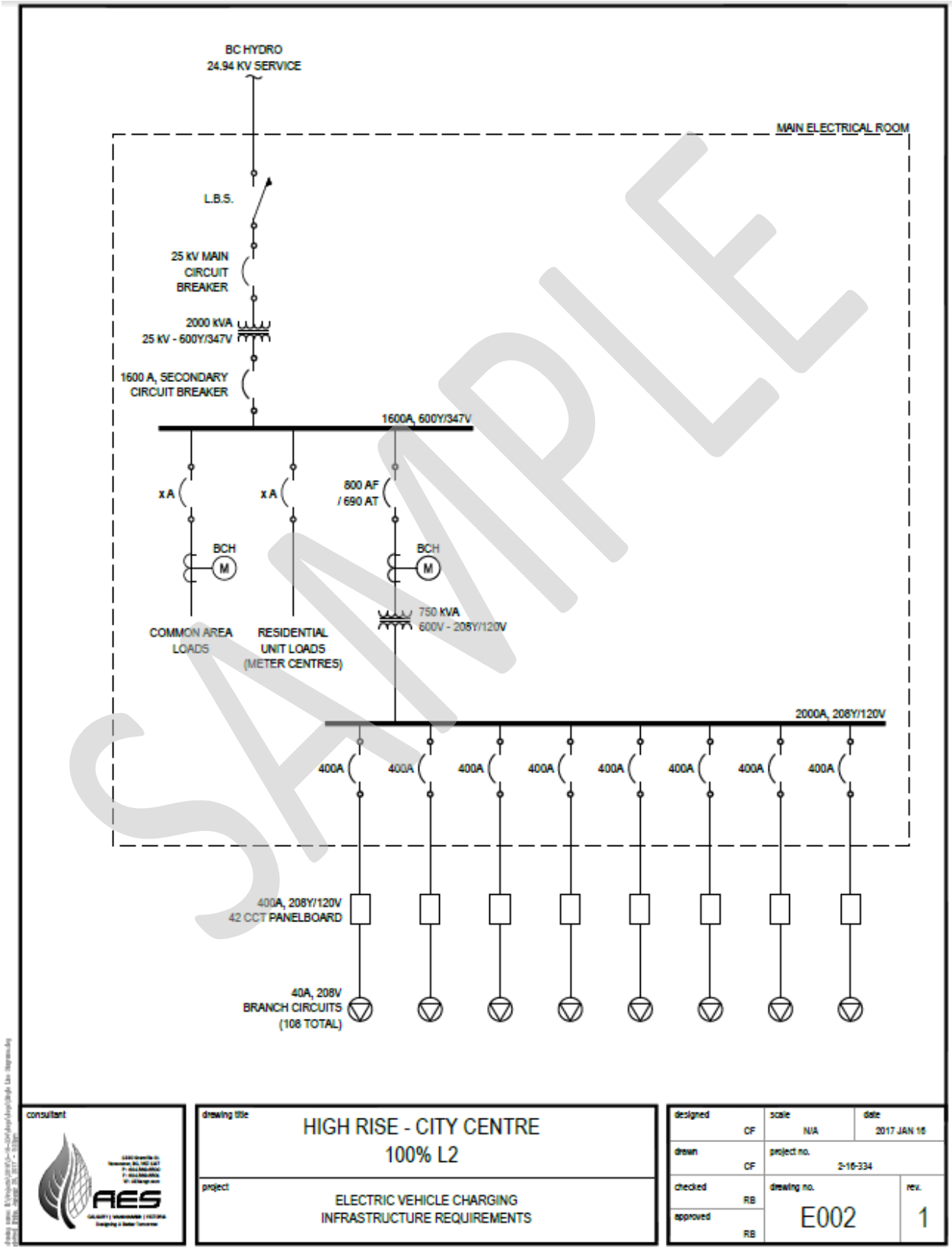
Should you have questions or comments concerning this bulletin, please contact the City of Richmond’s Sustainability Department via the main City phone line 604-276-4000.

For a complete copy of *Richmond Zoning Bylaw 8500, Section 7.15*, please visit the City of Richmond website at www.richmond.ca/cityhall/bylaws.

See attachments →

Attachment 1: Electrical Configuration for Dedicated Circuits – Multifamily Development

ILLUSTRATION ONLY – NOT FOR USE



Attachment 2: Electrical Configuration for 4-way Load Sharing Across a Circuit – Multifamily Development

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