



EV Ready Construction Requirements

No.: **ENGINEERING-06**

Date: **2024-07-09**

Purpose:

To inform owners/applicants, designers and builders of new construction to the requirements for residential and non-residential parking spaces to feature electrical outlets capable of providing electric vehicle (EV) charging as required by *Richmond Zoning Bylaw 8500 Amendment Bylaw No. 10463*.

Background:

Summary of Richmond's EV Charging Infrastructure Requirements

To support access to EV charging in residential parking spaces, Richmond City Council adopted *Richmond Zoning Bylaw 8500 Amendment Bylaw No. 9756*, on December 18, 2017. Council subsequently added requirements for non-residential parking spaces, adopting *Richmond Zoning Bylaw 8500 Amendment Bylaw No. 10463*, on September 5, 2023.

Residential, Hotel Guest Sleeping Room and Dormitory Parking Spaces (Richmond Zoning Bylaw 8500, Section 7.15.1.a):

- a) 100% of parking spaces shall feature an **energized outlet** capable of providing **Level 2 charging** or higher to the parking space *[Note that visitor parking spaces are considered "non-residential"]*.

Shared Vehicle Parking Spaces (Richmond Zoning Bylaw 8500, Section 7.15.1.c):

- a) 100% of **shared vehicle** parking spaces shall feature both **opportunity charging** and electric vehicle supply equipment.

Other ("Non-Residential") Parking Spaces – General Requirements:

For parking spaces associated with all other uses *[including visitor parking spaces]*:

General Requirement (Richmond Zoning Bylaw 8500, Section 7.15.1 d):

- a) 35% of parking spaces shall feature an **energized outlet** capable of providing **Level 2 charging** or higher to the parking space; and
- b) An additional 10% of parking spaces shall feature **opportunity charging**.

Alternate Compliance Pathway (Richmond Zoning Bylaw 8500, Section 7.15.3):

- a) an alternate allocation of **energized outlets** may be provided if the total installed capacity of the electrical circuits for **Level 2 charging** meets or exceeds 1.25 kW multiplied by the total number of parking spaces;

DC fast charging infrastructure may be used to meet some or all of total capacity requirement with the approval of the Director of Building Approvals.

Exemptions (Richmond Zoning Bylaw 8500, Section 7.15.5)

EV charging requirements do not apply to parking spaces identified in Agricultural Use Parking, fleet vehicle parking spaces, or loading spaces.

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Effective Date

The requirements apply to any new construction projects that submit a building permit application on or after October 1, 2023.

Exemptions Regarding Development Permit Applications

- As developments that are in-stream may face greater difficulty adjusting the design of parking areas and/or electrical systems to provide EV charging infrastructure, if a Development Permit has been issued prior to the effective date (October 1, 2023), the owner may construct in compliance with previous requirements if they submit a Building Permit application acceptable to the City during the period in which the Development Permit is valid; OR
- An acceptable Development Permit application has been submitted before September 5, 2023 (the date of Council's adoption of the requirements); AND
- A Development Permit has been issued prior to September 5, 2024; AND
- Have submitted a Building Permit application acceptable to the City prior to September 5, 2024 may construct in compliance with previous requirements.

Additional Requirements

The following considerations shall be taken into account for compliance with Richmond EV charging infrastructure requirements:

- When the calculation of number of parking spaces requiring an **energized outlet** results in a fractional figure, it shall be rounded upward to the nearest whole number.
- The EV charging infrastructure requirements set out in Richmond Zoning Bylaw 8500, Section 7.15.1.d) shall apply separately to the accessible parking spaces within the parking area, i.e.:
 - Under the General Requirement, 35% of accessible parking spaces shall feature an energized outlet capable of providing Level 2 charging or higher to the parking space and an additional 10% of accessible parking spaces shall feature opportunity charging.
- **Energized outlets** shall be labeled for their intended use of EV charging.
- Where an EV energy management system (EVEMS) and/or EV supply equipment is to be implemented the minimum performance standard must be met. (See below)

Definition of Terms

Level 2 Charging

Richmond Zoning Bylaw 8500 references the SAE International (the Society of Automotive Engineers) J1772 Standard, which defines "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

Energized Outlet

An **energized outlet** means a connected point in an electrical wiring installation at which current is taken and a source of voltage is connected to supply utilization equipment. This definition does not require the installation of **electric vehicle supply equipment (EVSE)**, otherwise known as 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)

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Other Terms Definitions

Term	Definition
DC fast charging	means EV supply equipment that provides direct current (DC) power to a vehicle with an output voltage of 50-1000V and typically supplies output power between 25 and 400kW.
Opportunity charging	means Level 2 charging (or higher) for an EV supported by a minimum 40A, dedicated electrical circuit for each parking space.
Shared vehicle	means a four-wheeled automobile, van, or light truck operated by a shared vehicle organization which provides vehicle-sharing services to its members, for a fee, with a car-sharing service by which such members have access to a fleet of shared vehicles which they may reserve for use.

Implementation:

Residential Developments – 100% of Parking Spaces

(Note: visitor parking spaces are non-residential parking spaces)

Part 9 Buildings with Private Parking Spaces (Single Family, Duplex, Multiplex, Townhome, etc.)

Residences such as single detached housing, two-unit housing, multiplex, 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 Level 2 energized outlets or better, such that an EVSE device wired into the outlet for a given parking space could easily reach the charging ports of a vehicle parked in that space. Plans submitted for Development Permit applications and Building Permit applications must indicate an energized outlet at all applicable stalls.

One electrical circuit can provide power to multiple outlets serving multiple parking spaces, provided that the minimum performance standard is met (see below).

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

Part 3 Buildings with Common Parking Areas (Including Hotel Guest Parking Spaces)

Apartments, and some townhouses, typically feature common parking areas (e.g. parkades).

Each residential parking space must feature an energized outlet capable of providing Level 2 charging.

Minimum Performance Standard: The system must be capable of supplying a minimum performance level of 12 kWh per parking space over an eight (8) hour period, assuming that all parking spaces are in use by a charging EV.

Two strategies may be used to meet the City's 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. Attachment 1 illustrates such a configuration.

2. EV Energy Management System (EVEMS)

EVEMS refers to a system used to control EV supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads. These systems are also variously referred to as load sharing, load management, smart charging, etc. Many EVEMS 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 EVEMS can reduce the load for which the building electrical systems must be constructed, thereby lowering cost relative to dedicated circuits. Section 8 of the 2021 edition of the *Canadian Electrical Code* recognizes the use of EVEMS.

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Note: Effective March 4, 2025 the Canadian Electrical Code, Part I, 26th Edition, Safety Standard for Electrical Installations, Canadian Standards Association (CSA) Standard C22.1-24 will be adopted as the BC Electrical Code. CSA notes that in the Canadian Electrical Code, 2024 Edition load calculations for installations with electric vehicle supply equipment have been revised in Section 8 and simplified through the deletion of Table 38.

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).

Non-residential Developments

Employee, customer, residential visitor and unclassified parking spaces, typically feature common parking areas. These parking areas can be enclosed, non-enclosed, or mix of both.

General Requirement:

10% of parking spaces (with a minimum of one parking space) are to have EV charging infrastructure installed capable of supporting a charging capacity of at least 6.66 kW at all times, suitable for short duration parking. In addition, 35% of parking spaces shall have EV charging infrastructure installed capable of supplying a minimum performance level of 12 kWh per parking space over an eight (8) hour period, suitable for longer duration parking. Similar to Section 3.1.2, dedicated circuits and EVEMS may be used to meet the requirements.

Alternate Compliance Pathway:

This alternate compliance pathway is intended to provide an equivalent total installed EV charging capacity as the general requirement. The total installed capacity of required charging infrastructure must exceed 1.25 kW multiplied by the total number of non-residential parking spaces. These requirements can be met using a tailored mix of dedicated and shared Level 2, and/or fast charging circuits. The charging infrastructure installed must be capable of supplying a minimum performance level of 12 kWh to each EV Ready parking space over an eight (8) hour period, assuming that all EV Ready parking spaces served by a given circuit are in use by a charging EV.

Additional Information and Resources

B.C. passed legislation on May 11, 2023, to enable strata corporations to more easily install electric vehicle (EV) charging. More information about this legislation along with helpful links for EV charging in strata corporations can be found here: gov.bc.ca/gov/content/housing-tenancy/strata-housing/operating-a-strata/the-environment/electric-vehicle-charging

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:

richmond.ca/_shared/assets/EV_Charging_in_Shared_Parking_Areas_Report51731.pdf

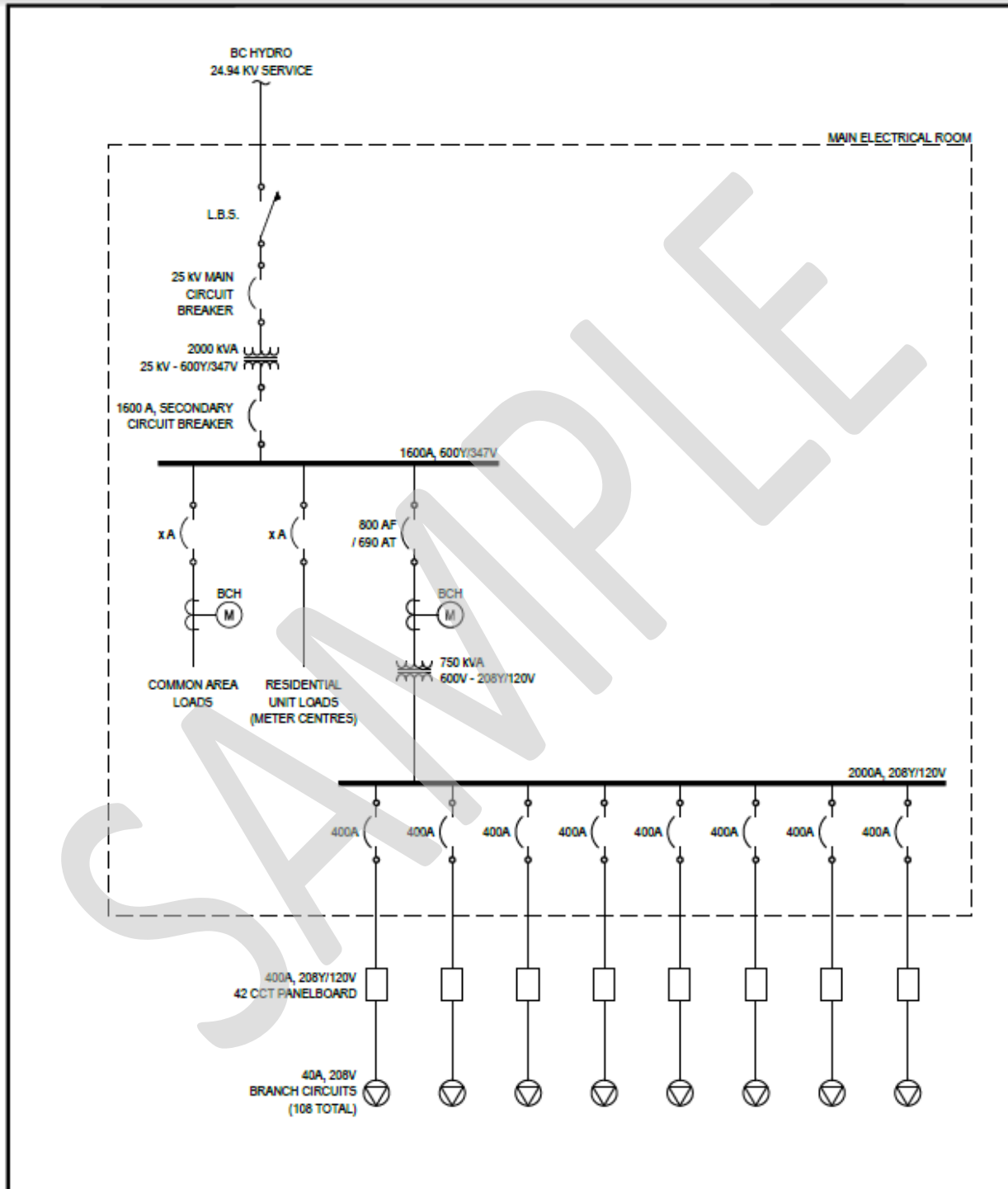
Technical Safety BC Information Bulletin has an information bulletin on: Electric Vehicle Supply Equipment (EVSE) and Electric Vehicle Energy Management Systems (EVEMS)

assets.contentstack.io/v3/assets/bltdec2ded849740f4d/blt68a482488d8bcc36/65c12ff417201a72264ab2fc/IB-EL_EVSE_EVEMS_Updated_January_26_2024.pdf

See over →

Attachment 1: Electrical Configuration for Dedicated Circuits – Multifamily Development

ILLUSTRATION ONLY – NOT FOR USE



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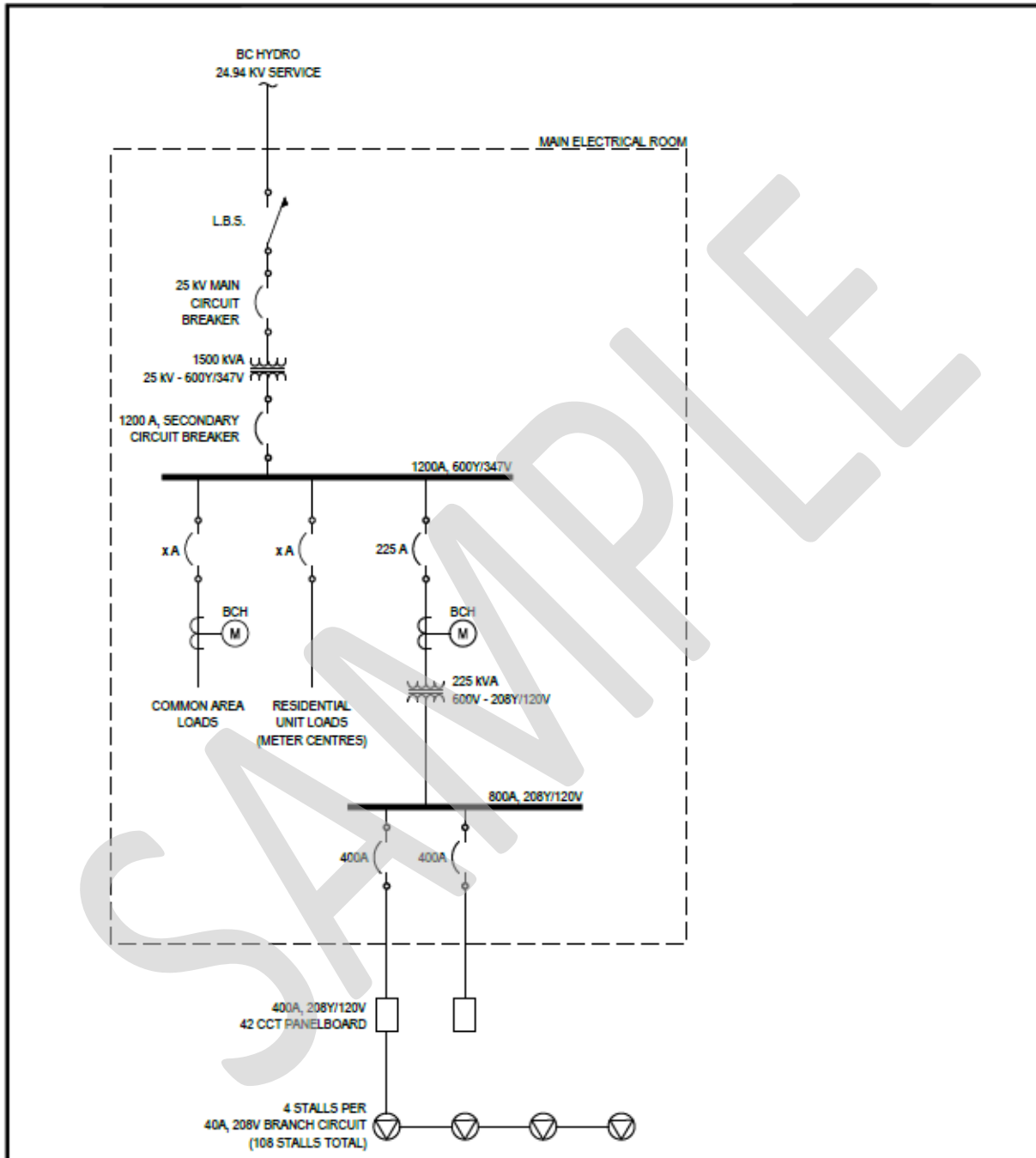
drawing title **HIGH RISE - CITY CENTRE**
100% L2

project **ELECTRIC VEHICLE CHARGING**
INFRASTRUCTURE REQUIREMENTS

designed	CF	scale	N/A	date	2017 JAN 16
drawn	CF	project no.	2-16-334		
checked	RB	drawing no.	E002		
approved	RB	rev.	1		

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

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drawing title	HIGH RISE - CITY CENTRE 100% L2, 4-SHARED		
project	ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS		

designed	CF	scale	N/A	date	2017 JAN 18
drawn	CF	project no.		2-16-334	
checked	RB	drawing no.		E003	rev.
approved	RB				1