

Electric Vehicle Charging Requirements – New Residential Construction

Purpose

To inform owners, applicants, designers and builders of new residential construction requirements for electric vehicle charging infrastructure.

Background

On November 4, 2019, the Municipal Council adopted **Township of Langley Zoning Bylaw 1987 No. 2500 Amendment (Electric Vehicle Charging) Bylaw 2019 No. 5396**, establishing electric vehicle (EV) charging infrastructure requirements for parking in new residential buildings.

This guide includes:

- Requirements for complying with the EV charging infrastructure requirements in TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME
- Performance requirements for adequate delivery of electrical energy for EV charging
- Management guidelines for charging infrastructure

Refer to Appendix A for definitions of italicized terms.

Requirements

In most new residential construction, one *energized outlet* capable of providing *Level 2 charging* is required per *dwelling unit*. Appendix B summarizes the requirements for specific residential uses as specified in Section 107.3 of the TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME.

These requirements apply to new Building Permit Applications submitted after November 4, 2019. Complete and valid building permit applications, submitted prior to the date of adoption of this bylaw are exempt from the EV Charging Requirements provisions in Section 107.3 provided that the building permit is issued within 6 months of bylaw adoption. For mixed-use projects, these requirements only apply to new residential units added to building space that was previously another use.

General

1. Parking spaces with *EV* charging requirements shall feature an *energized outlet* capable of providing *Level 2 Charging* or higher, installed adjacent to the parking space, intended solely to be used by *Electric Vehicle Supply Equipment* and labelled accordingly.
2. In residential uses listed in TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME (e.g. single family homes and townhomes), where there are two adjacent parking stalls in a private personal garage accessible to only one household, the *energized outlet* should be placed in equal proximity to both parking stalls to facilitate the use of dual head *electric vehicle supply equipment*.
3. In residential uses listed in TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME (i.e.. apartments, *dwelling units* as part of commercial or industrial uses, and seniors housing) a single BC Hydro (or other revenue grade) meter shall be provided for *electric vehicle supply equipment* loads in the building (i.e. buildings would feature a house meter, tenant meters, and an *electric vehicle supply equipment* meter).

Electric Vehicle Energy Management System

It is optional to use an *electric vehicle energy management system*. These systems control EVs electrical load and can reduce the load for which the building electrical systems must be constructed.

When an *electric vehicle energy management system* is used, the following requirements must be met.

1. In residential uses listed in TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME section 107.3a ii), iii), iv), v) (i.e.. townhomes, apartments, *dwelling units* as part of commercial or industrial uses, and seniors housing) and in institutional uses listed in section 107.3b ii) (e.g. community care facilities), a letter signed and sealed by an electrical engineer shall be submitted with the Building Permit application, confirming the design of the EV charging infrastructure will meet bylaw requirements, electrical code, and performance requirements (Table 1). When construction is complete, a letter signed and sealed by an electrical engineer shall be provided, confirming EV charging infrastructure was installed and meets bylaw requirements, electrical code, and performance requirements.
2. Charging performance shall comply with the performance requirements described in Table 1. The intent of the requirements is to ensure that there is adequate electrical supply for every vehicle to receive a full charge at least 90 percent of the time they charge overnight.

These performance requirements are based on the assumption that most *electric vehicles* will charge daily. Further, they were developed based on anticipated charging needs of Township vehicles as calculated using data such as: daily driving distance, statistical distribution, elevation variation, temperature, available charging time, average driving speeds, vehicle mix and efficiencies, and charging efficiencies.

The following table outlines minimum charging performance requirements but does not necessarily preclude implementation of alternate configurations to meet the intent of the requirements.

Table 1: Minimum Charging Performance Requirements

Minimum Circuit Breaker Rating (AMPS)	Number of Charge Ports Per Circuit
20	1
30	2
40	3
50	5
60	6
70	7
80	8
90	10
100	11
125	14
150	17

Guidelines

The following management guidelines are recommended, as a minimum:

- For designs where an *electric vehicle energy management system* is intended, the electrical infrastructure should include all communications equipment, control systems installation, licensing, and permitting required to operate the system
- Where an *electric vehicle energy management system* is implemented, provisions for management and maintenance should be provided to the strata or *dwelling unit* owner

Guidelines continued

- The following are recommended to be included in the strata rules or bylaws, as a minimum:
 - The party (strata or *dwelling unit* owner) responsible for *electric vehicle supply equipment* purchase and installation is clearly delineated, and appropriate permissions and procedures outlined to ensure accessibility to *energized outlets* for the purposes of *EV* charging
 - The *electric vehicle supply equipment* ownership is defined. Consideration should be given to how the parking space, electrical infrastructure, and supply equipment are defined as common property, fixtures, or chattels
 - Billing rules and procedures are established
 - Designation that where an *electric vehicle energy management system* is implemented, the *electric vehicle supply equipment* must be compatible with that *electric vehicle energy management system*

Building Permit Application Checklist

Building Permit Applicants shall include in their submission for multi-family and single-family dwellings:

Single-family:

1. Plans showing all residential parking spaces, energized outlets, and dedicated EV parking spaces. See Appendix C for an example.

Multi-family:

2. Plans showing all residential parking spaces, energized outlets, and dedicated EV parking spaces. See Appendix C for an example.
3. A single-line diagram showing all EV related electrical infrastructure. See Appendix D for an example.
4. A schedule showing the number of dwelling units and number of parking spaces featuring an adjacent energized outlet. This schedule will demonstrate that the EV charging requirements of section 107.3 of TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME are met. See Appendix E for an example.
5. A schedule showing the number of required parking spaces and the actual number of spaces provided; and the number of required EV parking spaces and the actual number of spaces provided, as per TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME. See Appendix F for an example.
6. A completed “SCHEDULE B: ASSURANCE OF PROFESSIONAL DESIGN AND COMMITMENT FOR FIELD REVIEW” (Forming Part of Subsection 2.2.7., Division C of the British Columbia Building Code) as required by the British Columbia Building Code.
7. A letter signed and sealed by an electrical engineer confirming the design of the EV charging infrastructure meets bylaw requirements, electrical code, and performance requirements (as applicable) noted in this guide.

Appendix A: Definitions

The definitions below are included in Section 102 of the TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME.

“DWELLING UNIT” means one or more habitable rooms occupied as residential accommodation by one family and containing or providing for only one set of cooking and/or laundry facilities located within a single family or multi-family zone. Excludes hotel or motel units or recreation vehicles. A maximum of two sets of cooking and/or laundry facilities may be permitted within an owner occupied fee simple detached single family principal dwelling unit, except where a coach house has already been legally constructed on a lot. On lands within the Agricultural Land Reserve one additional set of cooking and/or laundry facilities may be permitted on a lot in accordance with Provincial Agricultural Land Commission regulations.

“EV (ELECTRIC VEHICLE)” means a vehicle that uses electricity for propulsion and can use an external source of electricity to charge the vehicle’s batteries.

“ELECTRIC VEHICLE ENERGY MANAGEMENT SYSTEM” means a system to control electric vehicle supply equipment electrical loads comprised of monitor(s), communications equipment, controller(s), timer(s) and other applicable devices.

“ELECTRIC VEHICLE SUPPLY EQUIPMENT” 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 electric vehicle.

“ENERGIZED OUTLET” means a connected point in an electrical wiring installation at which current is taken to supply utilization equipment, which includes a covered outlet box.

“LEVEL 2 CHARGING” means a Level 2 electric vehicle charging level as defined by SAE International’s J1772 standard, as amended or replaced from time to time. The standard currently defines it as a 208/240 volt circuit with a 20 to 100 amp rating.

Figure 1: Example images



Electric Vehicle Supply Equipment



Energized outlet: outlet box with cover and electrical receptacle (6-50R)



Appendix B: EV Charging Infrastructure Requirements

The table below summarizes EV charging requirements from section 107.3 of TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME.

USE	EV CHARGING REQUIREMENTS*
a) Residential Uses;	
i) single family dwellings, two family dwellings, mobile homes mobile homes as temporary accessory dwellings	1.0 space per dwelling unit
ii) townhouses	1.0 space per dwelling unit 1.0 space per dwelling unit if parking is provided by tandem parking
iii) apartments	1.0 space per dwelling unit for studio apartments 1.0 space per dwelling unit for apartments having one or more bedrooms
iv) dwelling units as part of a commercial or industrial building.	1.0 space per dwelling unit
v) seniors' housing	1.0 space per 4 dwelling units
vi) accessory home occupation	Not Applicable
b) Institutional Uses;	
i) assembly uses, excluding educational uses	Not Applicable
ii) community care facilities excluding seniors' housing	1 space per 4 occupants or residents
iii) educational uses: kindergartens, elementary schools and group children's daycare secondary schools and other higher education	Not Applicable
iv) government institutional buildings	Not Applicable
v) recreational uses and facilities including commercial recreational uses	Not Applicable
c) Commercial Uses;	
i) hotels and motels campgrounds	Not Applicable
ii) commercial assembly uses (other than institutional and recreation uses), including theatres and funeral homes	Not Applicable

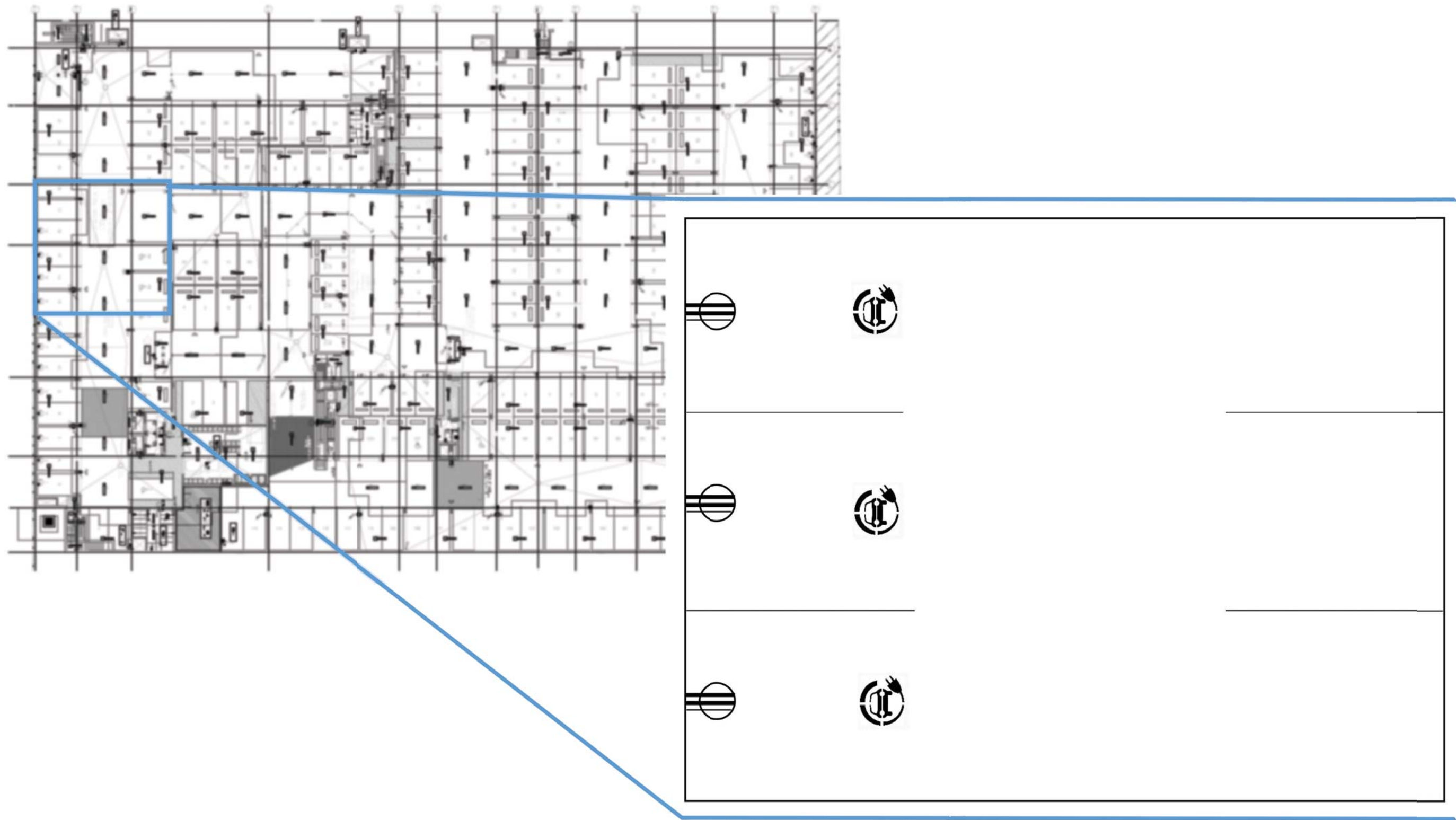
Appendix B continued: EV Charging Infrastructure Requirements

The table below summarizes *EV* charging requirements from section 107.3 of TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME.

USE	EV CHARGING REQUIREMENTS*
iii) bowling alleys	
iv) retail stores, service establishments, personal service use and licensee retail store uses except as otherwise stated	Not Applicable
v) offices, financial institutions	Not Applicable
vi) restaurants including food primary uses and brewery or distillery lounge areas	Not Applicable
vii) liquor primary use	Not Applicable
viii) golf driving ranges driving tee	Not Applicable
ix) golf courses	Not Applicable
– golf driving ranges	Not Applicable
– liquor primary and food primary uses accessory to a golf course shall comply with (Subsection 107.3 c) vii)	Not Applicable
– for golf course developments located adjacent to a Provincial Highway, the Ministry of Transportation and Highways should be contacted regarding site access and additional parking requirements	Not Applicable
x) marina class ‘A’ and ‘B’	Not Applicable
xi) marina class ‘C’	Not Applicable
xii) vehicle servicing	Not Applicable
d) Industrial Uses;	
i) service, general, heavy and other industrial uses	Not Applicable
i) laboratories	Not Applicable
e) Greenhouses;	
greenhouses when permitted to exceed a total lot coverage of 33% shall provide one parking space for every 1000 m ² of greenhouse gross floor area space, plus one space for every 15 m ² of gross floor area uses for accessory retail sales purposes	Not Applicable

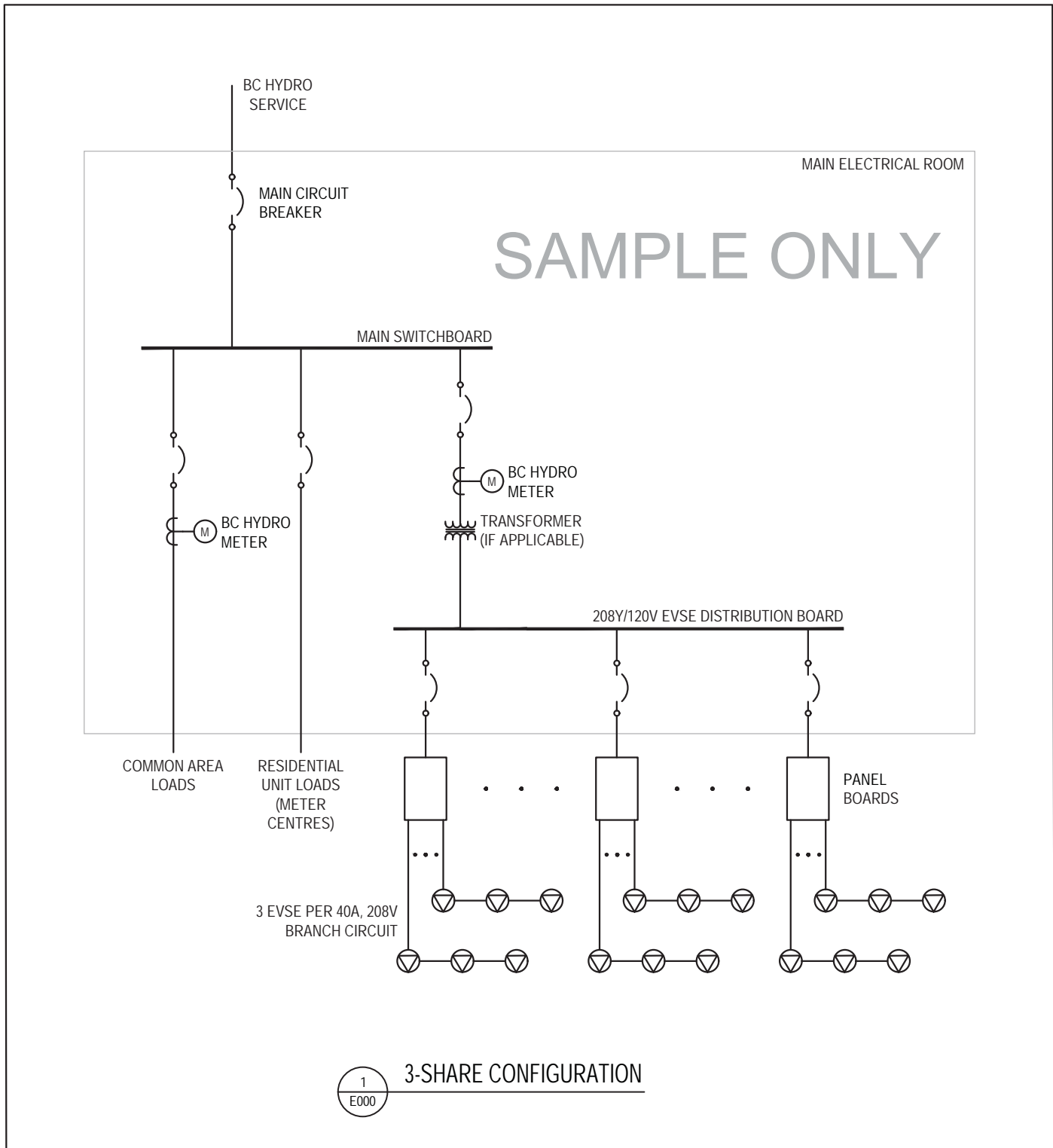
Appendix C: Parking Stall and EV Infrastructure Plan

Below is an example of an acceptable plan showing all residential parking spaces, *energized outlets*, and dedicated *EV* parking spaces. A full plan is required; the subset image is intended to provide a detailed view of the type of labelling expected.



Appendix D: Single-line Diagram

Below is an example of an acceptable single-line diagram showing all EV related electrical infrastructure.



<p>ELECTRICAL ENGINEERS:</p>  <p>AES Engineering Ltd. 505 Bernard Street, Suite 900 Vancouver, BC V7S 2M4 404.563.6000 www.aeseng.com</p>	<p>CLIENT:</p>  <p>Township of Langley Est. 1973</p>
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<p>PROJECT NAME: TOWNSHIP OF LANGLEY ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS</p>
<p>DRAWING TITLE: 3-SHARE CONFIGURATION</p>

DRAWING NUMBER:	
E000	
DATE:	12/13/2019
SCALE:	NTS
DRAWN BY:	KH
CHECKED BY:	RB
JOB NUMBER:	2-20-061

Appendix E: EV Schedule

Below is an example of an acceptable schedule showing the number of *dwelling units* and number of parking spaces featuring an adjacent *energized outlet*.

This example shows a project with 20 *dwelling units*, utilizing an *electric vehicle energy management system* to meet the performance requirements. One 90amp circuit supplies power for an *energized outlet* to 10 of the *dwelling units*, four different 20amp circuits supply power to four separate *dwelling units*, and one 60amp circuit supplies power to the remaining six *dwelling units*.

Dwelling Unit #	Parking Stall #	Adjacent Energized Outlet	Shared Circuit
1	1	x	90AMP
	2		
2	3	x	90AMP
	4		
3	5	x	90AMP
	6		
4	7	x	90AMP
	8		
5	9	x	90AMP
	10		
6	11	x	90AMP
	12		
7	13	x	90AMP
	14		
8	15	x	90AMP
	16		
9	17	x	90AMP
	18		
10	19	x	90AMP
	20		

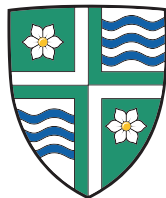
Dwelling Unit #	Parking Stall #	Adjacent Energized Outlet	Shared Circuit
11	21	x	20AMP
	22		
12	23	x	20AMP
	24		
13	25	x	20AMP
	26		
14	27	x	20AMP
	28		
15	29	x	60AMP
	30		
16	31	x	60AMP
	32		
17	33	x	60AMP
	34		
18	35	x	60AMP
	36		
19	37	x	60AMP
	38		
20	39	x	60AMP
	40		

Appendix F: Parking Space Schedule

Parking Space Type	Required Number of Spaces*	Actual Number of Spaces Provided
Residential	32 studio apartments X 1 space per dwelling = 32 spaces 55 multi-bedroom units X 1.5 spaces per dwelling = 83 spaces Total = 115 spaces	115
Visitors	Visitor parking = 10% of required apartment parking spaces (115) = 12 spaces	15
EV	32 studio apartment + 55 multi-bedroom units = 87 dwelling units 1 space per dwelling unit X 87 dwelling units = 87 spaces	87

* as per TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AS AMENDED FROM TIME TO TIME.

Township of
Langley



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