



# ELECTRIC VEHICLE READY REQUIREMENTS

Last Revised - May 3 2023



## 1.0 INTRODUCTION

### 1.1 OBJECTIVE

Supporting access to electric vehicle (EV) charging in the community is a priority action in the **City's Community Climate Action Plan**. The primary objective is to future-proof new residential development for the transition to electric transportation, which is being driven by provincial and federal sales target regulations that require all new passenger vehicles to be zero emissions by 2035.

This document is supplementary to, and is to be read in conjunction with, vehicle parking and EV charging infrastructure requirements in Zoning Bylaw No. 2023-08

Key terms used in this document are provided in Table 1. Official definitions are contained in the Zoning Bylaw.

Term	Definition
Electric Vehicle (EV)	Vehicle that uses electricity for propulsion and that can use an external source of electricity to charge the vehicle's batteries.
EV Energy Management System (EVEMS)	A system used to control electric vehicle supply equipment loads through the process of connecting, disconnecting, increasing, or reducing electric power to the loads and consisting of any of the following: a monitor(s), communications equipment, a controller(s), a timer(s), and other applicable device(s).
EV Ready	Construction requirements that include: electrical panel capacity, wiring, and continuous conduit or raceway (as applicable) from the panel, terminating at an Energized Outlet near the designated EV parking space(s). Additional electrical and EV charging infrastructure is required to energize the circuit and to supply power to future Level 2 EVSE and EVEMS (if applicable).
EV Supply Equipment (EVSE)	Complete assembly consisting of cables, connectors, devices, apparatus, and fittings that are installed for the purpose of power transfer and information exchange between the branch circuit and the EV.
Energized Outlet	A point connected to a source of voltage in an electrical wiring installation at which current is taken and can be connected to supply utilization equipment. An outlet includes a covered termination box, NEMA 14-50R receptacle, or NEMA 6-50R receptacle. Additional termination means may be approved by the City of Penticton Electric Utility Manager.
Level 2 Charging	Electric vehicle charging at 208 V or 240 V through supply utilization equipment that meets the definition of Level 2 by the standard "SAE Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler", J1772.
Residential Use	Occupancy or use of a building or part thereof as a dwelling, including single-family and multi-family residential.

# ELECTRIC VEHICLE READY REQUIREMENTS

## 1.2 BACKGROUND

Supporting EV adoption is aligned with the City's Community Climate Action Plan, as EVs are a more sustainable alternative to fossil fuel powered vehicles. In comparison to fossil fuel vehicles, EVs help to improve air quality, mitigate climate change, and reduce noise, among other benefits.

The availability of EV charging at home, at work, and on the go is an important factor in an individual's decision to purchase an EV. New homes and commercial buildings can be equipped with EV charging infrastructure at a relatively modest cost compared to retrofitting an existing building.

## 2.0 EV CHARGING INFRASTRUCTURE REQUIREMENTS

### 2.1 RESIDENTIAL DEVELOPMENT

To ensure new homes are built with ready access to a power supply capable of providing Level 2 EV charging, the following requirements must be met:

#### 2.1.1 PARKING REQUIREMENTS

- Minimum number of Energized Outlets for Level 2 Charging: 1 per dwelling unit.
  - Carriage houses are included as a dwelling unit under this Bylaw.
- EV Charging for parking spaces at secondary suites are exempt from this requirement.
- Where one or more accessible parking spaces are required by the Zoning Bylaw, a minimum 50% of the accessible parking spaces shall be EV ready.

### 2.2 COMMERCIAL BUILDINGS: COMMERCIAL, INDUSTRIAL, PUBLIC AND INSTITUTIONAL ZONES

To ensure new buildings are constructed with ready access to a power supply capable of providing Level 2 EV charging, the following requirements must be met:

#### 2.2.1 PARKING REQUIREMENTS

- Minimum 2, plus 1 for every 5 parking spaces over 10 parking spaces (Parking spaces as defined in Bylaw No. 2023-08)
- Where one or more accessible parking spaces are required by the Zoning Bylaw, a minimum 50% of the accessible parking spaces shall feature Energized Outlets for Level 2 Charging or higher.

## 3.0 TECHNICAL REQUIREMENTS

### 3.1 GENERAL

The following technical requirements must be included in EV Ready new builds:

- An electrical wire, originating from an electrical panel board and terminating near the parking space(s) at an Energized Outlet.

#### What is Level 2 Charging?

**SAE International's J1772 Standard** outlines the general physical, electrical, functional and performance requirements to facilitate conductive charging of electric vehicles in North America.

**Charge Method:** AC Level 2

**Nominal Supply Voltage (V):** 208V to 240V AC

**Max Current (A):** ≤ 80A

The amperage rating for EV circuits required by most EVSE is 40A, although this may differ depending on the system design.



Figure 1: NEMA 14-50 Receptacle

# ELECTRIC VEHICLE READY REQUIREMENTS

## 3.1 GENERAL

- Energized outlets shall be labelled for the use of EV charging to deter non-EV uses and to be consistent with the requirements of the Canadian Electrical Code (Section 86-306): “Each receptacle for electric vehicle charging be labelled in a conspicuous, legible, and permanent manner, identifying it as an electric vehicle supply equipment receptacle”.
- Single family dwellings, duplexes, townhouses, carriage houses only: One 40 A breaker/32 A circuit dedicated to serve the EVSE.
- Multi-Unit Residential and Commercial only: One circuit can be shared between up to four adjacent parking spaces; users will have the option to install a multi-headed charging station to serve multiple vehicles. Each stall must provide a minimum output of 1.7 kW per EVSE (Level 1 equivalent) from an overall EVEMS (see Figure 2).
- The City of Penticton may approve alternate options if it can be proven that the minimum output of each EVSE meets the requirements of the building occupants.

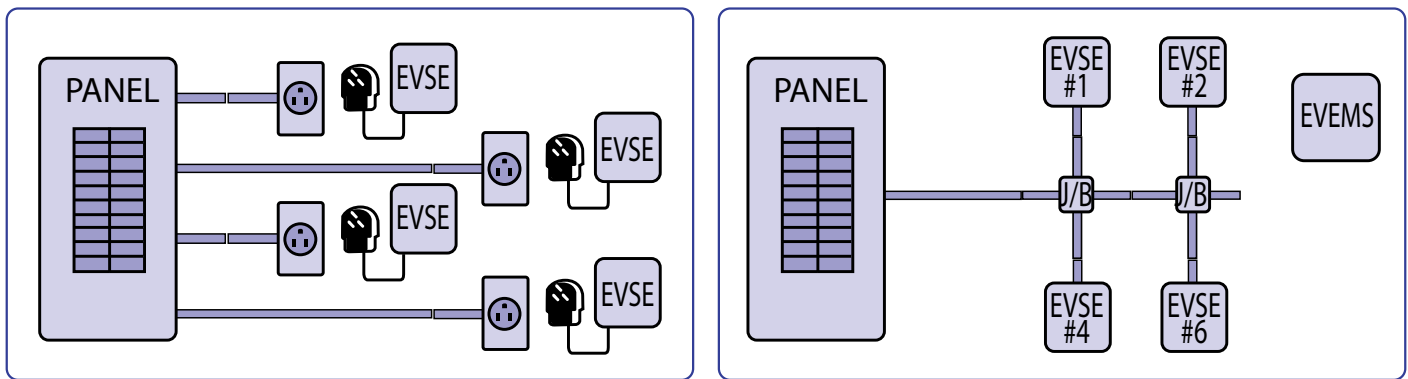


Figure 2: Dedicated circuits (left) compared to an electric vehicle energy management system (EVEMS) (right), showing the reduction in electrical infrastructure required for the EVEMS. (EVSE: electric vehicle supply equipment). Image courtesy of: [Residential Electric Vehicle Charging: A Guide for Local Governments](#)

## 3.2 USE OF AN ELECTRIC VEHICLE ENERGY MANAGEMENT SYSTEM (EVEMS)

Where an EVEMS is used the following conditions shall be met:

- All EVEMS must be approved for use by Technical Safety BC.
- Charging performance of power sharing circuits and a system-wide software based EVEMS requires a minimum output of 1.7 kW per parking stall.
- All communication equipment, control systems, licensing, etc. required for the proper function of the EVEMS is installed prior to issuance of final occupancy for the building.
- All necessary permits, authorization, and variances under the Electrical Safety Regulation, BC Reg. 179/2022, and other required regulations have been obtained for the installation and operation of the EVEMS.
- Installed EVSE must be compatible with the selected EVEMS.

## 3.3 BUILDING PERMIT REQUIREMENTS

Building Permit applicants for new construction must include the following information in their submission to be reviewed by the Energy and Environment department or their designate:

- Plans showing all EV-ready parking spaces, energized outlets, and future EVSE.
- A single-line diagram showing all EV charging-related electrical infrastructure.

# ELECTRIC VEHICLE READY REQUIREMENTS

## 4.0 GUIDELINES AND RESOURCES

### 4.1 EV CHARGING SYSTEM MANAGEMENT GUIDELINES

It is recommended to address the following in strata rules, lease agreements, rental agreements, and/or bylaws:

- Clear delineation of which party (e.g. strata or unit owner or tenant) is responsible for EVSE purchase and installation, and a clear description of the appropriate permissions and procedures that ensure accessibility to the electrical infrastructure for the purpose of EV charging.
- Clear delineation of who owns the EVSE.
  - Consideration should be given to how the parking stall, electrical infrastructure, and EVSE are defined as common property, fixtures, or chattels.
- Establish billing rules and procedures.
- Consideration for who will supply, install, own, manage and operate the EVSE should be given.

### 4.2 INFORMATION AND RESOURCES

It is recommended to address the following in strata rules, lease agreements, rental agreements, and/or bylaws:

- Residential EV Charging: A Guide for Local Governments (BC Hydro)
- Guide to EV Charging in Multi-Unit Residential Buildings (NRCan)
- EV Energy Management Systems Process – FAQ (Technical Safety BC)
- Go Electric (Clean BC)
- Electric Vehicle Charging Stations – Information and Billing (Measurement Canada)

**Have Questions? We're here to help. Please contact the Planning Department**

 **250-490-2501** or  **planning@penticton.ca**

**Located at City Hall on the first floor at 171 Main St, Penticton BC V2A 5A9**

**Please note:** Development Services Bulletins are prepared to provide convenient information for customers, and should not be considered a replacement for reviewing the bylaw or associated legal documents. If there is any contradiction between this guide and relevant municipal bylaws and/or applicable codes, please refer to the bylaws and/or codes for legal authority.

**Office Use:** 1300-1599 INFORMATION SYSTEMS AND SERVICES\1490 Records Management\1490-09 Forms Management\Planning\EV Charging

# APPENDIX A: ELECTRIC VEHICLE READY REQUIREMENTS

## EV READY PARKING STALL AND ELECTRIC VEHICLE SUPPLY EQUIPMENT PLAN (MULTI-UNIT)

Below is an example of an acceptable plan showing required EV Ready parking spaces, junction boxes, and future EVSE.

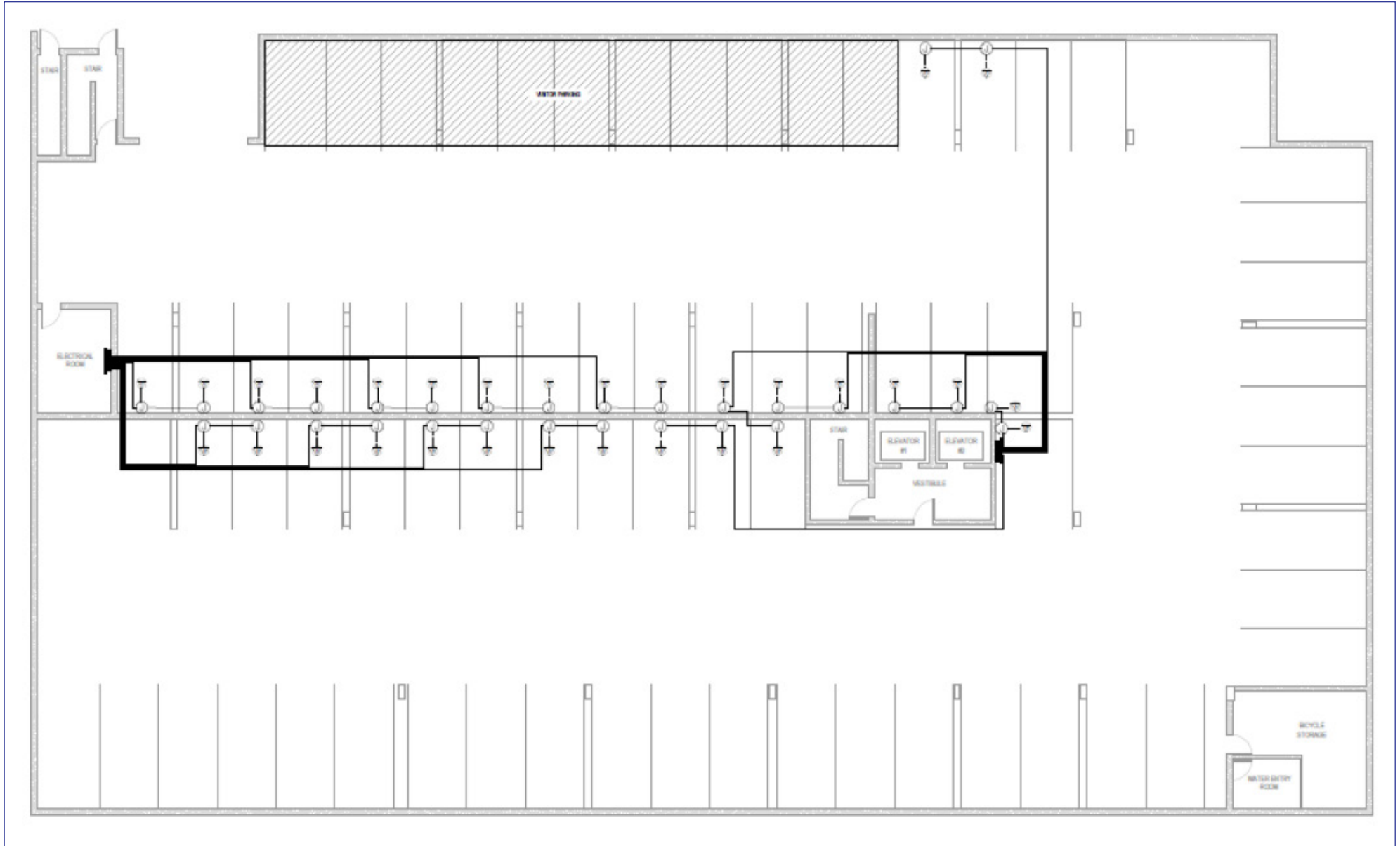


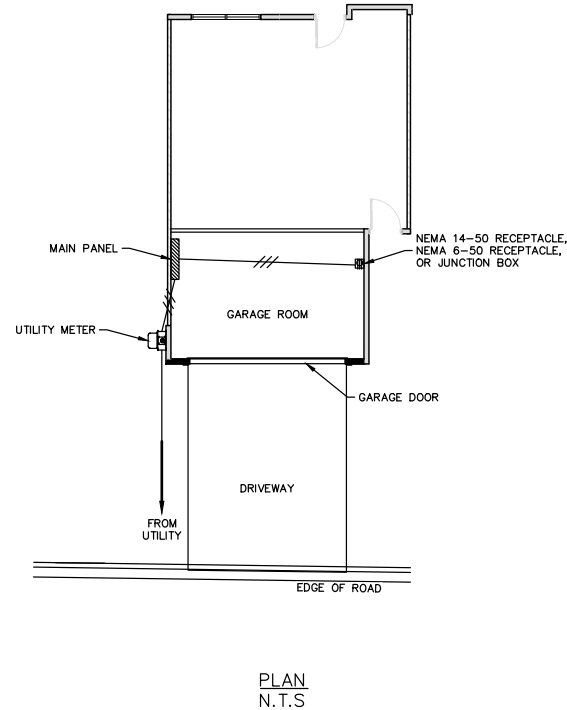
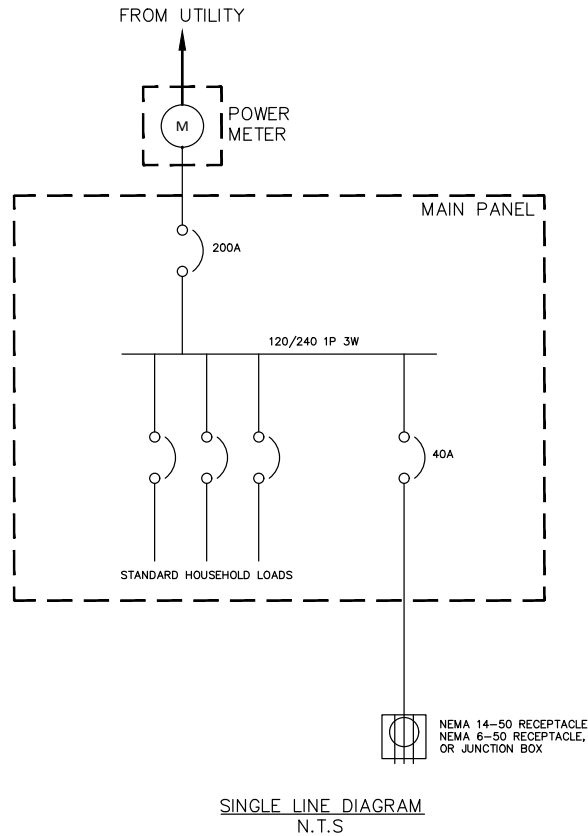
Figure 3: Courtesy of the City of Kamloops

# APPENDIX B: ELECTRIC VEHICLE READY REQUIREMENTS



## EV READY PARKING STALL AND ELECTRIC VEHICLE SUPPLY EQUIPMENT PLAN (SINGLE FAMILY DWELLING)

Below is an example of an acceptable plan showing required EV Ready parking spaces, junction boxes, and future EVSE.



### GENERAL NOTES:

1. INSTALL EV CHARGING INFRASTRUCTURE IN COMPLIANCE WITH MANUFACTURER RECOMMENDATIONS, CEC SECTION 86, AND OTHER RELEVANT CODES AND REGULATIONS.
2. ENSURE THE ELECTRICAL PANEL HAS SUFFICIENT CAPACITY TO ACCOMMODATE THE LEVEL 2 EV CHARGING INFRASTRUCTURE.
3. INSTALL A MINIMUM OF ONE ENERGIZED OUTLET PER DRAWING UNIT FOR LEVEL 2 CHARGING, COMPLY WITH CEC SECTION 86-306 FOR LABELING REQUIREMENTS.
4. COORDINATE THE INSTALLATION OF THE EV ENERGY MANAGEMENT SYSTEM (EVEMS) AND EV SUPPLY EQUIPMENT (EVSE) AS PER THE MANUFACTURER'S SPECIFICATIONS.
5. ENSURE ALL NECESSARY PERMITS AND AUTHORIZATIONS HAVE BEEN OBTAINED BEFORE INSTALLATION.
6. VERIFY THAT THE MAIN SERVICE IS SUFFICIENT FOR PEAK DEMAND WHEN THE EV CHARGER IS INSTALLED, IN ACCORDANCE WITH CEC SECTION 8.
7. ENSURE THAT ALL ELECTRICAL COMPONENTS AND WIRING FOR EV CHARGING INFRASTRUCTURE ARE PROTECTED FROM WEATHER AND VANDALISM.
8. CONTRACTOR TO LEAVE 24"x24" OF WALL SPACE AVAILABLE AROUND JB'S FOR EV CHARGER INSTALLATION.
9. THE INFORMATION SHOWN IN THE DRAWING IS GENERIC IN NATURE AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES, AS EACH SINGLE HOME CONSTRUCTION IS UNIQUE. THE DRAWING IS INTENDED TO SERVE AS A GUIDELINE FOR THE INSTALLATION OF EV READY CHARGING STATIONS FOR A SINGLE HOUSEHOLD. FOR SPECIFIC CONSTRUCTION DETAILS, CONSULT A PROFESSIONAL ENGINEER AND/OR ELECTRICIAN TO ENSURE THE DESIGN AN DINSTALLTIOON COMPLY WITH ALL RELEVANT CODES, REGULATIONS, AND SITE-SPECIFIC CONDITIONS.

### LEGEND:

—//— CABLE IN CONDUIT



SINGLE FAMILY / TOWNHOUSE EV READY CHARGING INFRASTRUCTURE

Scale: N.T.S  
Plot Date: 2023/04/11  
Drawn By: S.STEARNS



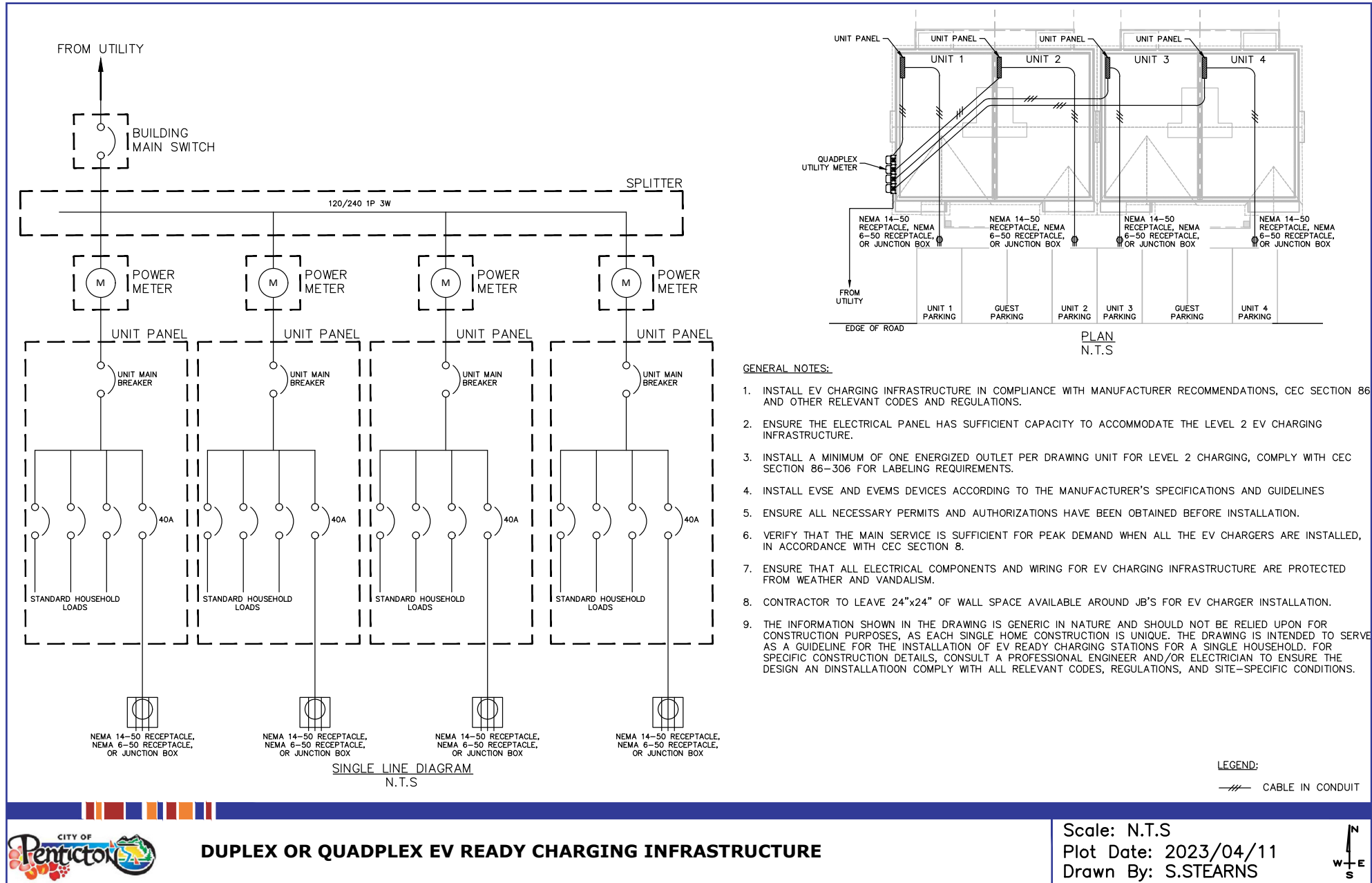
Figure 4: Courtesy of the City of Penticton

# APPENDIX C: ELECTRIC VEHICLE READY REQUIREMENTS



## EV READY PARKING STALL AND ELECTRIC VEHICLE SUPPLY EQUIPMENT PLAN (FOUR-PLEX)

Below is an example of an acceptable plan showing required EV Ready parking spaces, junction boxes, and future EVSE.



### DUPLEX OR QUADPLEX EV READY CHARGING INFRASTRUCTURE

Figure 5: Courtesy of the City of Penticton



# APPENDIX D: ELECTRIC VEHICLE READY REQUIREMENTS

## SINGLE-LINE DIAGRAM (COURTESY OF THE CITY OF KAMLOOPS)

Below is an example of an acceptable single-line diagram showing all EV charging system electrical infrastructure for a building.

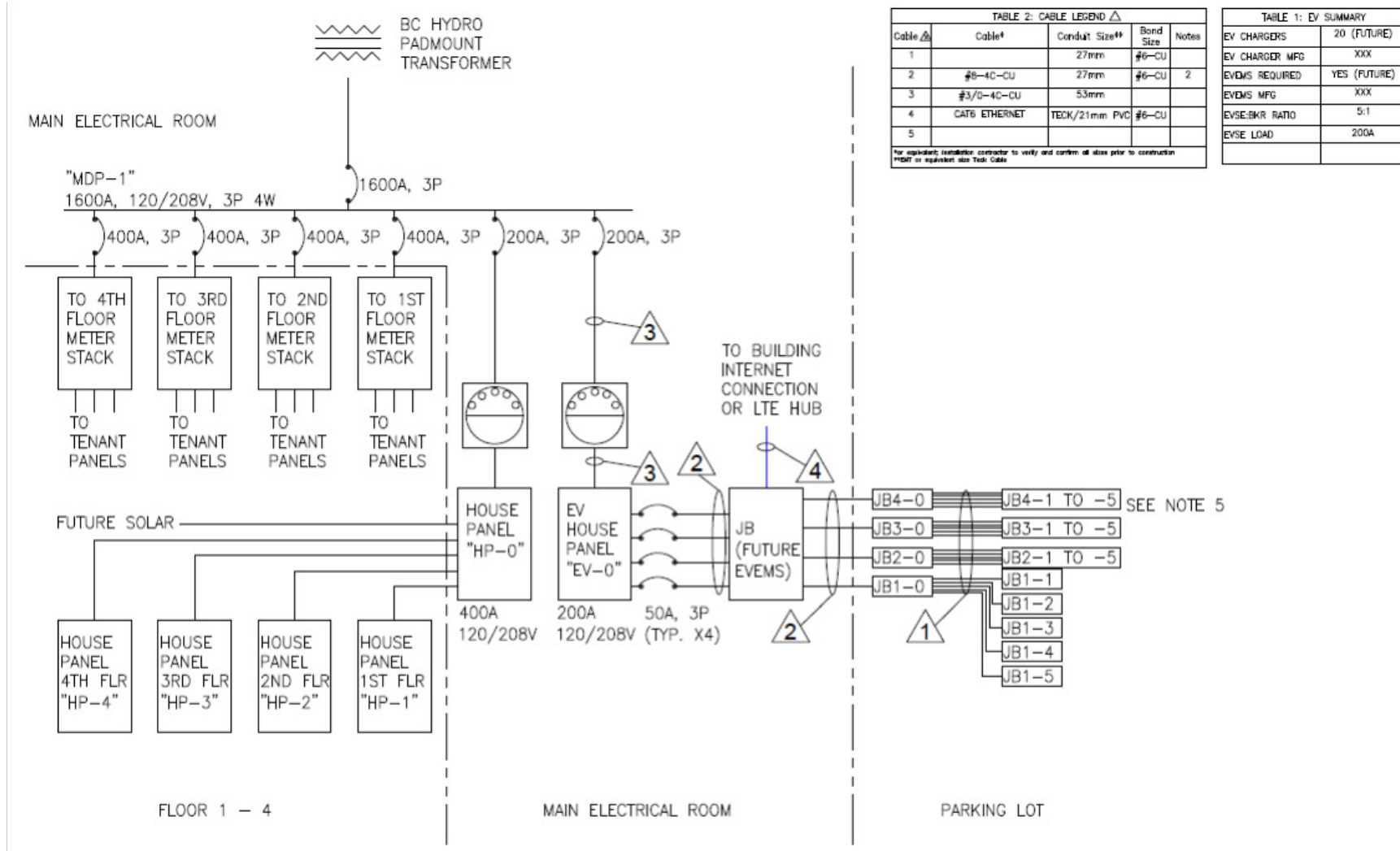


TABLE 2: CABLE LEGEND

Cable #	Cable*	Conduit Size**	Bond Size	Notes
1		27mm	#6-CU	
2	#6-4C-CU	27mm	#6-CU	2
3	#3/0-4C-CU	53mm		
4	CAT6 ETHERNET	TECK/21mm PVC	#6-CU	
5				

\*For equivalent installation, contractor to verify and confirm all sizes prior to construction  
\*\*EIT or equivalent size Teck Cable

TABLE 1: EV SUMMARY

EV CHARGERS	20 (FUTURE)
EV CHARGER MFG	XXX
EVMS REQUIRED	YES (FUTURE)
EVMS MFG	XXX
EVSE:MKR RATIO	5:1
EVSE LOAD	200A

- NOTES**
- ALL DEVICES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ALL RELEVANT CODES AND REGULATIONS
  - FUTURE EV CHARGER BANK (X5) TO BE FED OFF OF ONE BREAKER. LOAD TO BE SHARED BETWEEN ALL CHARGERS.
  - VARIOUS HOUSE PANEL, EVMS, EVSE, JB, AND CABLE CONFIGURATIONS ARE POSSIBLE. SUBJECT TO MFG SPECIFICATIONS. CONFIGURATION SHOWN IS FOR INFORMATION PURPOSES ONLY.
  - SEE DWG E-XX FOR DETAILED BUILDING SLD
  - IF RECEPTACLES ARE INSTALLED INSTEAD OF JB'S, LABELS AS PER CE CODE 86-306 ARE REQUIRED
  - EVMS AND CONTROL SYSTEM REQUIRES HARDLINE INTERNET CONNECTION; EVMS TO MONITOR INDIVIDUAL EV CHARGERS FOR BILLING PURPOSES
  - MAIN SERVICE IS SUFFICIENT FOR PEAK DEMAND WHEN ALL EV CHARGERS ARE INSTALLED AS PER CE CODE SECTION 8
- SCOPE OF WORK**
- INSTALLATION OF ALL DEVICES SHOWN REQUIRED DURING CONSTRUCTION.
  - EVMS AND EV CHARGERS TO BE INSTALLED IN FUTURE.
  - CONTRACTOR TO LEAVE 48" X 24" OF WALL SPACE AVAILABLE FOR FUTURE EVMS SURROUNDING THE EVMS JUNCTION BOX.
  - CONTRACTOR TO LEAVE 24" X 24" OF WALL SPACE AVAILABLE AROUND JB'S FOR EV CHARGER INSTALLATION

REV	DATE	BY	NOTES	TITLE
0	12/01/22	AY	/	SAMPLE SINGLE-LINE DRAWING FOR INFORMATION ONLY NOT FOR CONSTRUCTION
				DWG NO. xxxxx-xxxxx
				DWG DESC. EV SLD
				DWG EV01
				REV /

Figure 6: Courtesy of the City of Kamloops