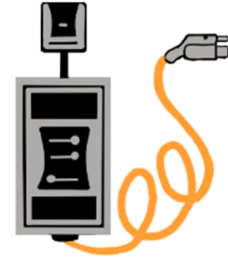


## **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) FOR RESIDENTIAL**

Electric Vehicle Supply Equipment (EVSE) installation requires an electrical permit from Building Department. For EVSE system located outdoor, review and approval by Planning Department is required prior to issuance of permit. EVSE components consist of coupler, cord, and interactive equipment. EVSE shall be listed and labeled by an approved nationally recognized testing laboratory. EVSE must be installed according to the manufacturer's installation instructions and its listing. It must be rated for outdoor use if not within an enclosed garage.



There are two types EVSE for home use i.e. Level 1 and Level 2. EVSE level 1 plugs directly into a standard 120 volt receptacle outlet. Permit is not required for EVSE level 1 if the electrical receptacle outlet used to plug-in EVSE level 1 is existing. If new electrical circuit for receptacle outlet to be installed, permit is required. It is required to install a dedicated individual circuit per CEC 210.17.

EVSE level 2 installations require permit and inspections from the Building Department. EVSE Level 2 charging system requires 240 volts electrical circuit. Installing EVSE level 2 often requires changes to building wiring and may also require upgrading the electric service panel. In order to obtain the permit some basic information needed to verify the existing electrical service can handle the added load.

### **Submit 2 sets of plans to the Building Department including:**

- Complete the City of Ontario building permit application form (available at Building Department web site).
- Provide copy of EVSE manufacturer's installation instructions & specifications.
- Provide site plan showing location of the building, garage, property lines, street, electric service, and subpanel if any. Indicate electric service & subpanel ampere rating, voltages, and phase.
- Provide floor plan showing location of the EVSE in the garage or carport.
- Indicate on plan the manufacturer name and model number of the EVSE. Also indicate the EVSE as level 1 or 2 on plan.
- Show the electrical wiring layout from electrical panel to EVSE. Specify wire size & insulation type, and conduit type & size, including equipment grounding conductor type & size, and circuit overcurrent protection device (breaker) size. Show lockable type disconnect location & rating (required for EVSE rated more than 60 Amp or more than 150 volts to ground).
- Include load calculation worksheet shown on page 2.
- Include also General Installation Requirements for EVSE shown on page 3.

**ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) LEVEL 2 – SERVICE LOAD CALCULATION**

LOAD DESCRIPTION	TYPICAL USAGE (WATTS OR VOLT AMPS)	TOTAL (WATTS OR VOLT AMPS)
<b>GENERAL LIGHTING LOADS</b>		
Dwelling area square footage: _____ x 3 watts/ft <sup>2</sup> =		
Small appliance branch circuits (2 min.): 1,500 VA x _____ circuits =		
Laundry circuit: 1,500 VA x _____ circuits =		
<b>APPLIANCES AND EQUIPMENT</b>		
Values are minimum, use actual values if known to be greater. Enter N/A if not present at project site.		
Microwave (in dedicated space)	1,300	
Trash Compactor	1,000	
Dishwasher	1,200	
Garbage Disposal	800	
Electric clothes dryer	5,000	
Electric oven	8,000	
Electric range	8,000	
<b>Proposed EVSE circuit</b> (use name plate rating in watts or calculate as: Ampere of circuit x 240 volts = Watts)		
Pool/Spa pump 1 Hp	1,920	
Pool/Spa pump 1.5 Hp	2,400	
Pool/Spa pump 2 Hp	2,880	
Garden Fountain pump 1 Hp	1,920	
Other: _____		
Other: _____		
SUBTOTAL (A) =		
[SUBTOTAL (A) - 10,000 VA] x 0.4 = (B) =		
10,000 WATTS AT 100% = (C) =		10,000
SUBTOTAL (D) = (B) + (C) =		
TOTAL A/C LOAD, USE NAMEPLATE RATING OR A/C CIRCUIT BREAKER RATING (E) =		
<b>TOTAL (F) = (D) + (E) =</b>		

Total demand is (F) / 240 V = \_\_\_\_\_ Amps. If this value is less than the rating of the existing electrical service or subpanel NO service or subpanel upgrade is necessary. If the value is greater, an EVSE permit may only be issued if panel upgrade is included with the work. A subpanel upgrade requires a plan submittal.

**STATEMENT OF COMPLIANCE**

**BY MY SIGNATURE, I ATTEST THAT THE INFORMATION PROVIDED IS TRUE AND ACCURATE.**

Site Address: \_\_\_\_\_

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Note: Use of this electrical load calculation estimate methodology is at the user's risk and carries no implied guarantee or accuracy. Users of this methodology and these forms are advised to seek professional assistance in determining the electrical capacity of service panel.

<p><b>PLAN CHECKER NOTES:</b></p>          
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**GENERAL INSTALLATION REQUIREMENTS FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT LEVEL 2 FOR RESIDENTIAL USE.**

1. **GENERAL REQUIREMENTS:** All Electrical Vehicle Supply Equipment (EVSE) shall comply with the applicable sections of the California Electrical Code, including Article 625.
2. **LISTED EQUIPMENT:** Electrical Vehicle Supply Equipment (EVSE) and its components shall be listed and labelled by a nationally recognized testing laboratory.
3. **EQUIPMENT HEIGHT:** The coupling means of the Electric Vehicle Supply Equipment shall be stored at a height of not less than 18” above the floor level for indoor sites [CEC 625.50] and 24” above the parking surfaces for outdoor sites [CEC 625.50].
4. **FASTENED IN PLACE:** Electric Vehicle Supply Equipment (EVSE) must be permanently connected and fastened in place in accordance with the manufacturer’s installation instructions. [CEC 625.44]
5. **PROTECTION FROM PHYSICAL DAMAGE:** Electric Vehicle Supply Equipment (EVSE) shall be protected against vehicle impact damage when located in the path of vehicle. In order to avoid the installation of a substantial pipe bollard as an equipment guard, locate the Electric Vehicle Supply Equipment on a garage side wall, out of vehicular path (see sample drawing below). [CEC 110.27(B)]
6. **IF MORE THAN 60 AMPS:** For Electric Vehicle Supply Equipment (EVSE) rated more than 60 amps or more than 150 volts to ground, the disconnect means shall be provided and installed in a readily accessible location. The disconnecting means shall be capable of being locked on the open position. [CEC 625.42]
7. **OVERCURRENT PROTECTION:** Overcurrent protection for feeders and branch circuits supplying Electric Vehicle Supply Equipment (EVSE) shall be sized for continuous duty and shall have a rating of not less than 125% of the maximum load of the Electric Vehicle Supply Equipment. [CEC 625.40]
8. **MARKINGS:** Where Electric Vehicle Supply Equipment is installed indoor, Electric Vehicle Supply Equipment shall be listed and clearly marked by the manufacturer as follows: “VENTILATION NOT REQUIRED”. The marking shall be located so as to be clearly visible after installation. [CEC 625.52(A) & 625.15(B)]
9. **RACEWAYS:** All raceways on exterior of buildings shall be suitable for wet locations. [CEC 225.22 & 300.9]

**SAMPLE OF ELECTRICAL PLAN  
FOR LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)**

