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| COO Logo Building Dept | **CITY OF ONTARIO** **BUILDING DEPARTMENT**303 East B StreetOntario, CA 91764Ph: (909)395-2023, Email: buildingcounter@ontarioca.gov | **INFORMATION BULLETIN****201**Effective: 4 / 1 / 2016 Revised: 10 / 16 / 2024 |
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| **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)****FOR RESIDENTIAL** |

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| 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 of 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 recommended to install a dedicated individual circuit.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. **Provide 2 sets of plans to the Building Department including:*** **Plan review will be performed at front counter.**
* 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, electrical main service panel, and subpanel if any. Indicate electrical main service panel & 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.

 Approved by: James Caro (Building Official Director)  Date:  Prepared by: Setiawan Ganda (Senior Plan Check Engineer)  |

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

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| **LOAD DESCRIPTION** | **TYPICAL USAGE (WATTS OR VOLT AMPS)** | **TOTAL (WATTS OR VOLT AMPS)** |
| **GENERAL LIGHTING LOADS** |
|  Dwelling area square footage: \_\_\_\_\_\_\_\_\_\_\_\_\_ x 3 watts/ft2 = |  |  |
|  Small appliance branch circuits (2 min.): 1,500 VA x \_\_\_\_circuits = |  |  |
|  Laundry circuit: 1,500 VA x \_\_\_\_circuits = |  |  |
| **APPLIANCES AND EQUIPMENT** 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 |  |
|  **Proposed EVSE circuit** (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,OOO WATTS AT 100% = (C) = | 10,000 |
| SUBTOTAL (D) = (B) + (C) = |  |
| TOTAL AIR CONDITIONING (A/C) LOAD, USE NAMEPLATE RATING OR A/C CIRCUIT BREAKER RATING, (E) =  |  |
| **TOTAL (F)** = (D) + (E) = |  |

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.

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| PLAN CHECKER NOTES: |

**GENERAL INSTALLATION REQUIREMENTS FOR ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) FOR RESIDENTIAL USE BASED ON 2022 CALIFORNIA ELECTRICAL CODE (CEC) ARTICLE 625:**

1. **LISTED EQUIPMENT:** All EVSE equipment shall be listed [CEC 625.5].
2. **ELECTRIC VEHICLE BRANCH CIRCUIT**: Each outlet installed for charging electric vehicles shall be supplied by an individual branch circuit. Each circuit shall have no other outlets. [CEC 625.40].
3. **EQUIPMENT HEIGHT:** The coupling means of the EVSE shall be stored at a height of 18” min. above the floor level for indoor locations and 24” min. above the parking surfaces for outdoor locations except portable EVSE [CEC 625.50].
4. **GFCI PROTECTED:** All receptacles installed for the connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel [CEC 625.54].
5. **PROTECTION FROM PHYSICAL DAMAGE:** 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 EVSE on a garage side wall, out of vehicular path (see sample drawing below) [CEC 110.27(B)].
6. **DISCONNECTING MEANS:** For 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 625.43].
7. **OVERCURRENT PROTECTION:** Overcurrent protection for feeders and branch circuits supplying EVSE shall be sized for continuous duty and shall have a rating of not less than 125% of the maximum load of the equipment [CEC 625.41].
8. **LOCATION:** EVSE installed in garage shall be listed for charging electric vehicles indoors without ventilation [CEC 625.52(A)]. All receptacles installed in a wet location for the connection of electric vehicle charging shall have an enclosure that is weatherproof with the attachment plug cap inserted or removed e.g., listed extra duty outlet box hood [CEC 625.56].
9. **RACEWAYS:** All raceways on exterior of buildings shall be listed or approved for use in wet locations and insulated conductors used in wet locations shall be of a type listed for use in wet locations. [CEC 225.22 & 300.10(C)]

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

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NEW ½” EMT CONDUIT WITH 2 - #8 THHN CONDUCTORS & 1 - #10 THHN GROUND

NEW 32 AMP MAX CHARGING LEVEL 2 EVSE HARDWIRED

NEW 40 AMP CIRCUIT BREAKER INSTALLED IN EXISTING ELECTRIC METER PANEL