



## Community Development Department Building Division

### SINGLE FAMILY DWELLING ELECTRICAL LOAD CALCULATION: (OPTIONAL METHOD)

Purpose: To illustrate the method for sizing an electrical service.

Contractor \_\_\_\_\_ Address \_\_\_\_\_

#### CEC Section: 220:82

General light, power \_\_\_\_\_ SF x 3 volt-amperes = \_\_\_\_\_ volt-amperes

Two kitchen appliance circuits @ 1,500 volt-amperes = 3,000 volt-amperes

Laundry circuits = 1,500 volt-amperes

Electric range (NP rating) = \_\_\_\_\_ volt-amperes

Wall mounted oven (NP rating) = \_\_\_\_\_ volt-amperes

Water heater (NP rating) = \_\_\_\_\_ volt-amperes

Dishwasher (NP rating) = \_\_\_\_\_ volt-amperes

Disposal (NP rating) = \_\_\_\_\_ volt-amperes

Dryer (NP rating) = \_\_\_\_\_ volt-amperes

Other \_\_\_\_\_ = \_\_\_\_\_ volt-amperes

Subtotal \_\_\_\_\_ volt-amperes

Subtotal \_\_\_\_\_ volt-amperes 10,000 volt-amperes (First 10 kilo volt-amperes @ 100%)  
= 10,000 volt-amperes

Difference \_\_\_\_\_ volt-amperes (Remaining volt-amperes x 40%) = \_\_\_\_\_ volt-amperes

#### **Heating and Air-Conditioning (The Largest of the following shall be included):**

1. Air conditioning and cooling (100% NP rating) = \_\_\_\_\_ volt-amperes

2. Heat pump without supplemental heating (100% NP rating) = \_\_\_\_\_ volt-amperes

3. Heat pump with supplemental electric heating (100% NP rating plus 65%) = \_\_\_\_\_ volt-amperes

4. Electrical space heating < 4 separate units (65% NP rating) = \_\_\_\_\_ volt-amperes

5. Electrical space heating ≥ 4 separate units (40% NP rating) = \_\_\_\_\_ volt-amperes

6. Electrical thermal storage and other (100% NP rating) = \_\_\_\_\_ volt-amperes

Total \_\_\_\_\_ volt-amperes Total volt-amperes \_\_\_\_\_ ÷ 240 volts = \_\_\_\_\_ (amps size for service entrance conductors and panel)

### Single Family Dwelling Load Calculation – Step by Step Example (Optional Method) CEC 220.82

2800 sq. ft.

14 kW range

3 kW water heater

5 kW clothes dryer

1.5 kW dishwasher

15 kW central heat

29 amp, 240 volt air conditioning

#### Step 1:

Multiply the sq. ft. area by 3 VA per Sq. ft.

2800 sq. ft. X 3 VA = 8,400 VA (VA = volt amperes)

#### Step 2:

Add in 1500 VA for each 2-wire, 20-amp small appliance branch circuit and the laundry circuit

1,500 VA X 3 = 4,500 VA

#### Step 3:

Add in the appliances loads at nameplate value.

Range 14,000 VA Water heater 3,000 VA

Clothes dryer 5,000 VA

Dishwasher 1,500 VA

#### Step 4:

Add all appliance loads together. Total = 36,400 VA

#### Step 5:

Take the first 10 kW at 100%. 10,000 VA Take the remainder (26,400 VA) at 40%.

26,400 VA X .40 = 10,560 VA

#### Step 6:

Add the two values from step 5 together to find the general load. 10,000 VA + 10,560 VA = 20,560 VA

#### Step 7:

Compare the heating load to the AC load and take the larger of the two loads. AC load at 100%.

29 amps X 240 volts = 6,960 VA Heat load at 65%. 15,000 VA X .65 = 9,750 VA (largest load).

#### Step 8:

Add the general load to the largest of the AC or heating load. General load = 20,560 VA

Heating load = 9,750 VA Total = 30,310 VA

#### Step 9:

Divide the load in VA by the voltage. 30,310 VA ÷ 240 = 126 amps.