

SECTION 130.5 –ELECTRICAL POWER DISTRIBUTION SYSTEMS

(a) Service Metering.

Each electrical service shall have permanently installed user-accessible metering of total electrical energy use per TABLE 130.5-A.

EXCEPTION to Section 130.5(a) Buildings for which the utility company provides a meter for occupant or user use that indicates instantaneous kW demand and kWh for a user-resettable period.

(b) Disaggregation of Electrical Circuits.

Electrical power distribution systems shall be designed to permit the disaggregated measurement of electrical load energy uses downstream from the service meter according to TABLE 130.5-B. Additive and subtractive methods may be used to determine aggregate and disaggregated energy use. This may be accomplished by any of the following methods:

1. Separate switchboards, motor control centers, or panelboards to which are connected only the required load or group of loads; or
2. Subpanels of the above to which are connected only the required load or group of loads and for which the subpanel load can be independently measured in aggregate; or
3. Branch circuits, taps or disconnects requiring overcurrent protection devices rated 60 amperes or greater.

EXCEPTION 1 to Section 130.5(b) Buildings for which a complete metering and measurement system is provided that at a minimum measures and reports the loads called for in TABLE 130.5-B.

EXCEPTION 2 to Section 130.5(b) Alterations where all of the following conditions exist are not required to comply with this section:

- A. The following existing equipment remains in place:
 - i. Service distribution switchboards or panelboards; and
 - ii. Feeders; and
 - iii. Motor control centers or panelboards.
- B. Existing equipment included in Item A (above) remains unaltered except for:
 - i. Changes to load circuit connections; or
 - ii. Changes to the quantity of outgoing overcurrent protection devices; or
 - iii. Changes to the ampacity of outgoing overcurrent protection devices.

(c) Voltage Drop

1. **Feeders.** Feeder conductors shall be sized for a maximum voltage drop of 2 percent at design load.
2. **Branch Circuits.** Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.

EXCEPTION to Section 130.5(c): Feeder conductors and branch circuits that are dedicated to emergency services.

(d) Circuit Controls for 120-Volt Receptacles.

In all buildings, both controlled and uncontrolled 120 volt receptacles shall be provided in each private office, open office area, reception lobby, conference room, kitchenette in office spaces, and copy room. Additionally, hotel/motel guest rooms shall comply with Item 5. Controlled receptacles shall meet the following requirements, as applicable:

1. Electric circuits serving controlled receptacles shall be equipped with automatic shut-OFF controls following the requirements prescribed in Section 130.1(c) (1 through 5); and

2. At least one controlled receptacle shall be installed within 6 feet from each uncontrolled receptacle or a splitwired duplex receptacle with one controlled and one uncontrolled receptacle shall be installed; and
3. Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles; and
4. For open office areas, controlled circuits shall be provided and marked to support installation and configuration of office furniture with receptacles that comply with Section 130.5(d) 1, 2, and 3; and
5. For hotel and motel guest rooms at least one-half of the 120-volt receptacles in each guest room shall be controlled receptacles that comply with Section 130.5(d)1, 2, and 3. Electric circuits serving controlled receptacles shall have captive card key controls, occupancy sensing controls, or automatic controls such that, no longer than 30 minutes after the guest room has been vacated, power is switched off.
6. Plug-in strips and other plug-in devices that incorporate an **occupant sensor** shall not be used to comply with this requirement.

EXCEPTION 1 to Section 130.5(d): In open office areas, controlled circuit receptacles are not required if, at time of final permit, workstations are installed, and each workstation is equipped with an occupant sensing control that is permanently mounted in each workstation, and which controls a hardwired, nonresidential-rated power strip. Plug-in strips and other plug-in devices that incorporate an occupant sensor shall not be used for this exception.

EXCEPTION 2 to Section 130.5(d): Receptacles that are only for the following purposes:

- i. Receptacles specifically for refrigerators and water dispensers in kitchenettes.
- ii. Receptacles located a minimum of six feet above the floor that are specifically for clocks.
- iii. Receptacles for network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms.
- iv. Receptacles on circuits rated more than 20 amperes.

(e) Demand responsive controls and equipment.

Demand responsive controls and equipment shall be capable of receiving and automatically responding to at least one standards based messaging protocol which enables **demand response** after receiving a **demand response signal**.

(f) Energy Management Control System (EMCS).

1. An EMCS may be installed to comply with the requirements of one or more lighting controls if it meets the following minimum requirements:
 - A. Provides all applicable functionality for each specific lighting control or system for which it is installed in accordance with **Section 110.9**; and
 - B. Complies with all applicable Lighting Control Installation Requirements in accordance with **Section 130.4** for each specific lighting control or system for which it is installed; and
 - C. Complies with all applicable application requirements for each specific lighting control or system for which it is installed, in accordance with **Part 6**.
2. An EMCS may be installed to comply with the requirements of a thermostat if it complies with all applicable application requirements for each thermostat in accordance with Part 6.

TABLE 130.5-A MINIMUM REQUIREMENTS FOR METERING OF ELECTRICAL LOAD

	Services	Services rated more than	Services rated more than 250	Services rated
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Meter Type	rated 50 kVA or less	50kVA and less than or equal to 250 kVA	kVA and less than or equal to 1000kVA	more than 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not required	Not required	Required	Required
Resettable kWh	Required	Required	Required	Required
kWh per rate period	Not required	Not required	Not required	Required

TABLE 130.5-B MINIMUM REQUIREMENTS FOR SEPARATION OF ELECTRICAL LOAD

Load Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each
Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each
Renew able power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renew able power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

CERTIFICATE OF COMPLIANCE

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NRCC-ELC-01-E**Disaggregation of Electrical Circuits**

Project Name:		Date:
Project Address:	Climate Zone:	Conditioned Floor Area :
		Unconditioned Floor Area :
General Information		
Building Type:	<input type="checkbox"/> Nonresidential	<input type="checkbox"/> High-Rise Residential
	<input type="checkbox"/> Schools	<input type="checkbox"/> Relocatable Public Schools
	<input type="checkbox"/> Conditioned Spaces	<input type="checkbox"/> Unconditioned Spaces
Phase of Construction:	<input type="checkbox"/> New Construction	<input type="checkbox"/> Addition
		<input type="checkbox"/> Alteration
Documentation Author's Declaration Statement		
<ul style="list-style-type: none"> I certify that this Certificate of Compliance documentation is accurate and complete. 		
Name:	Signature:	
Company:	Date :	
Address:	If applicable:	
	CEA #	
	CEPE #	
City/State/Zip	Phone:	
Principal Designer's Declaration Statement		
<ul style="list-style-type: none"> I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the design of electrical circuiting. This Certificate of Compliance identifies the features and performance specifications required for compliance with Title 24, Parts 1 and 6 of the California Code of Regulations. The design features represented on this Certificate of Compliance are consistent with the information provided to document this design on the other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 		
Name:	Signature:	
Company :	Phone:	
Address:	License #	
City/State/Zip:	Date:	

CERTIFICATE OF COMPLIANCE

Project Name:

Date:

A. Electrical Service Metering

Fill out a separate line for each electrical service that is connected to the building.

Compliance is required for each electrical service, as set out in Table 130.5-A:

Meter Rating (kVA)	50 kVA or less	More than 50kVA and less than or equal to 250 kVA	More than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Instantaneous (at the time) kW demand	Required	Required	Required	Required
Historical peak demand (kW)	Not required	Not required	Required	Required
Resettable kWh	Required	Required	Required	Required
kWh per rate period	Not required	Not required	Not required	Required

Electrical Service Schedule	Electrical Service Rating	Metering Capabilities (check all that are present)				Field Inspector	
		Instantaneous (at the time) kW demand	Historical peak demand (kW)	Resettable kWh	kWh per rate period	Pass	Fail
Designation/location in building/description	kVA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CERTIFICATE OF COMPLIANCE

Project Name:

Date:

B. Disaggregation of Electrical Circuits

- Fill out a separate line for each switchboard, motor control center, panelboard and subpanel
- Each panel is required to be disaggregated according to the requirements of Table 130.5-B.
- Individual branch circuits, taps or disconnects that require overcurrent protection devices rated 60A or greater are exempt.

Load Type	Services rated 50 kVA or less	Services rated more than 50kVA and less than or equal to 250 kVA	Services rated more than 250 kVA and less than or equal to 1000kVA	Services rated more than 1000kVA
Lighting including exit and egress lighting and exterior lighting	Not required	All lighting in aggregate	All lighting disaggregated by floor, type or area	All lighting disaggregated by floor, type or area
HVAC systems and components including chillers, fans, heaters, furnaces, package units, cooling towers, and circulation pumps associated with HVAC	Not required	All HVAC in aggregate	All HVAC in aggregate and each HVAC load rated at least 50 kVA	All HVAC in aggregate and each HVAC load rated at least 50kVA
Domestic and service water system pumps and related systems and components	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Plug load including appliances rated less than 25 kVA	Not required	All plug load in aggregate Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area Groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf	All plug load separated by floor, type or area All groups of plug loads exceeding 25 kVA connected load in an area less than 5000 sf
Elevators, escalators, moving walks, and transit systems	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Other individual non-HVAC loads or appliances rated 25kVA or greater	Not required	All	Each	Each
Industrial and commercial load centers 25 kVA or greater including theatrical lighting installations and commercial kitchens	Not required	All	Each	Each
Renewable power source (net or total)	Each group	Each group	Each group	Each group
Loads associated with renewable power source	Not required	All loads in aggregate	All loads in aggregate	All loads in aggregate
Charging stations for electric vehicles	All loads in aggregate	All loads in aggregate	All loads in aggregate	All loads in aggregate

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ELEC-1C

Project Name:

Date:

Electrical Service Schedule	Electrical Service Rating	Switchboard, motor control center, panelboard or subpanel	Field Inspector	
			Pass	Fail
Designation/location in building/description	kVA	Designation/location in building/description	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

C. Voltage Drop

Feeder conductors and branch circuits that are dedicated to emergency services are exempt from these requirements.

	Field Inspector	
	Pass	Fail
Feeders. Feeder conductors shall be sized for a maximum voltage drop of 2 percent at design load.	<input type="checkbox"/>	<input type="checkbox"/>
Branch Circuits. Branch circuit conductors shall be sized for a maximum voltage drop of 3 percent at design load.	<input type="checkbox"/>	<input type="checkbox"/>

CERTIFICATE OF COMPLIANCE

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ELEC-1C

Project Name:

Date:

D. Circuit Controls for 120-Volt Receptacles

- Controlled 120 volt receptacles shall be provided in each private office, open office area, reception lobby, conference room, kitchenette in office spaces, and copy room. Controlled receptacles shall meet the following requirements.
- In open office areas, controlled circuit receptacles are not required if, at time of final permit, workstations are installed, and each workstation is equipped with an occupant sensing control that is permanently mounted in each workstation, and which controls a hardwired, nonresidential-rated power strip. Plug-in strips and other plug-in devices that incorporate an occupant sensor shall not be used for this exception.
- Receptacles that are only for the following purposes are exempt:
- Receptacles specifically for refrigerators and water dispensers in kitchenettes.
 - Receptacles located a minimum of six feet above the floor that are specifically for clocks.
 - Receptacles for network copiers, fax machines, A/V and data equipment other than personal computers in copy rooms.

	Field Inspector	
	Pass	Fail
1. Electric circuits serving controlled receptacles shall be equipped with automatic shut-OFF controls following the requirements prescribed in Section 130.1(c)(1 through 5) .	<input type="checkbox"/>	<input type="checkbox"/>
2. At least one controlled receptacle shall be installed within 6 feet from each uncontrolled receptacle or a split-wired duplex receptacle with one controlled and one uncontrolled receptacle shall be installed.	<input type="checkbox"/>	<input type="checkbox"/>
3. Controlled receptacles shall have a permanent marking to differentiate them from uncontrolled receptacles.	<input type="checkbox"/>	<input type="checkbox"/>
4. For open office areas, controlled circuits shall be provided and marked to support installation and configuration of office furniture with receptacles that comply with Section 130.1(a)130.5(d) 1, 2, and 3.	<input type="checkbox"/>	<input type="checkbox"/>
5. Plug-in strips and other plug-in devices that incorporate an occupant sensor shall not be used to comply with this requirement.	<input type="checkbox"/>	<input type="checkbox"/>

