
ELECTRICAL GUIDE for HEALTH FACILITIES REVIEW

**HOSPITALS
SKILLED NURSING FACILITIES
AND CLINICS**

2016

**Office of Statewide Health Planning and Development
Facilities Development Division**

Forward

The Office of Statewide Health Planning and Development (OSHPD) is responsible for enforcing all building standards, codes, and regulations pertaining to hospitals, skilled nursing facilities, and under specific circumstances, clinics in the State of California.

The following document was compiled by the OSHPD electrical engineering staff as a guide for plan review to verify compliance and is intended for OSHPD use. All others who use this information for any other purpose do so with the full knowledge that it may not contain every requirement or change in policy and that the requirements are as interpreted by OSHPD.

Title 24, Part 3, California Electrical Code, as well as other parts of Title 24, apply in the design and construction of health care facilities. This guide highlights and summarizes the most common requirements encountered in the review of hospitals, skilled nursing facilities, and clinics. This document may not contain every requirement or change in policy and the requirements are as interpreted by OSHPD.

All projects submitted on or after January 1, 2016, are subject to the 2016 California Electrical Code (CEC) which is based on the 2014 National Electrical Code (NEC) with the 2016 California amendments.

**Office of Statewide Health Planning and Development Facilities
Development Division**
www.oshpd.ca.gov

Table of Contents

Plan Submittal Check List	5
General Health Care Facility Requirements	
Electrical Devices, Equipment and Installation	6
Device Identification	6
Fire Pump.....	7
Panelboards	7
Essential Power Branch Circuits	7
Fire Alarm, Emergency Communications	7
Raceways and Cables	8
Lighting.....	9
Grounding.....	10
Coordination	10
Elevators	11
Corridors, Hallways, Entrances, Exits	12
Mobile Medical Facilities	12
Receptacles	13
Receptacles	14
Nurse Call Systems—Acute Care Hospital.....	15
Nurse Call Systems—Skilled Nursing Facility.....	15
Location of Nurse Call Devices (<i>California Building Code, Table 1224.4.6.5</i>)	16
Acute Care Hospital Requirements	
System Segregation, Service Equipment, Electrical/Mechanical Rooms, Telephone Equipment Rooms, Data Rooms	17
Generator, Fuel Supply, Transfer Switches.....	18
HVAC, Sump Pumps, Medical Air, Medical Gas, Chiller Rooms, Smoke Control Systems, Plumbing Fixtures and Equipment, Isolation Rooms	19
Food Preparation Area, Kitchens, Nourishment	20
Clean Utility Rooms, Soiled Utility Rooms, Central Supply	20
Blood, Bone and Tissue Banks, Human Physiology Laboratory	20
Medication Preparation Area, Pharmacy	21
Sterile Compounding Pharmacies, Hazardous and Non-Hazardous Drugs.....	21

Nurse Station, Control Station/Desk	21
Patient Bedroom, Antepartum Bedroom, Postpartum Bedroom, Labor Room, Labor Recovery Room	22
Intensive Care Unit, Critical Care Areas	23
Lithotripsy	23
Fluoroscopy, CT Scanner, X-Ray, Diagnostic Equipment, Mammography, Imaging, MRI	24
Hemodialysis	24
Labor/Delivery/Recovery (LDR), Labor/Delivery/Recovery/Postpartum (LDRP)	25
Nursery	25
Neonatal Intensive Care Unit (NICU)	26
Operating Room, Delivery Room, Caesarean Section Room, Trauma Room, Angioplasty, Cardiac Cath Lab, Cystoscopy, Laser Operating, Interventional Radiology, Anesthetizing Area	27
Emergency Room, Emergency Exam Room, Emergency Treatment Room, Emergency Triage Room	28
Recovery Room, Post-Anesthetic Care Unit (PACU), Pre-Op	28

Acute Psychiatric Hospital Requirements

Receptacles in Patient Care Areas, Emergency Generator Fuel Supply, Nurse Call System	29
---	----

Skilled Nursing Facility Requirements

System Segregation, Service Equipment, Electrical/Mechanical Rooms	30
Generator, Fuel Supply, Transfer Switches	31
HVAC, Sump Pumps, Chiller Rooms, Smoke Control Systems, Medical Gas Alarm, Plumbing Fixtures	32
Nurse Station, Medication Preparation Area, Pharmacy Dispensing Area, Critical Branch Receptacle, Patient Room Receptacle	33
Dining and Recreation Areas	33
Receptacles	33

Sub-Acute Care Nursing Facility Requirements

Sub-Acute Care Nursing Facility Requirements	34
--	----

Clinic Requirements

Ambulatory Surgical Clinic, Hemodialysis Clinic	35
---	----

PLAN SUBMITTAL CHECK LIST

The following may be used as a guide to check that submitted plans are complete and reviewable by OSHPD.

Item	Description
1	All electrical plans and specifications signed by the electrical engineer of record and responsible person in charge of the project.
2	List of symbols and abbreviations used on plans and their meaning
3	Correct electrical code cited. Refer to OSHPD Code Application Notice (CAN) 1 for current enforceable codes.
4	Room/area names and numbers on all plan sheets.
5	Single line diagram of the electrical system. Clearly identify the normal and essential electrical system (i.e. Life Safety, Critical, Equipment).
6	Site plan with area names showing electrical equipment locations, electrical utility runs, and site lighting.
7	Drawings showing details of all switchboards, panels, and equipment.
8	Load calculations or other approved methods showing verification of load capacity for all equipment and conductors. Refer to OSHPD Policy Intent Notice (PIN) 38, <i>Electrical Load Capacity Verification Guideline</i> for more information.
9	Panel schedules with accurate circuit descriptions, power branch/system type, buss and overcurrent protection ratings, connected load, demand load, and totalized load.
10	Schedules of equipment requiring electrical connection (mechanical equipment, conduit/feeder schedules, etc.).
11	Show existing electrical devices as they relate to the project for code verification (i.e. nurse call devices, receptacles, etc.).
12	Location and circuiting for all electrical devices.
13	Fire alarm system - Provide specifications for equipment, show locations of all devices, and show power sources.
14	Nurse call system - Provide specifications for equipment, show locations of all devices, and show power sources.
15	All equipment including x-ray and diagnostic equipment must be listed by a Nationally Recognized Testing Laboratory.
16	Seismic certification for equipment as required by the California Building Code.

GENERAL HEALTH CARE FACILITY REQUIREMENTS

General		ELECTRICAL DEVICES, EQUIPMENT, AND INSTALLATION	
Item	Branch	Requirements	Applicable Codes
1		All electrical devices and equipment shall be listed, labeled, or certified for its use by a Nationally Recognized Testing Laboratory (NRTL).	CEC 110.2
2		Listed or labeled equipment shall be installed in accordance with the instructions provided by its manufacturer.	CEC 110.3(B)

General		DEVICE IDENTIFICATION	
Item	Branch	Requirements	Applicable Codes
1	Life Safety Critical	All receptacles and light switches connected to emergency system shall have a distinctive marking or color to identify they are on emergency system.	CEC 517.30(E) CEC 517.41(E)
2	Critical	All receptacles in critical care patient areas shall be marked with the panel and circuit number supplying them.	CEC 517.19(A)
3		Identify all boxes and enclosures on emergency system.	CEC 700.10(A)
4		Panelboards shall have an accurate circuit directory.	CEC 408.4(A)
5		All switchboard and panelboards shall be mark to indicate the device or equipment where power supply originates.	CEC 408.4(B)
6		Electrical equipment shall be marked to warn qualified persons of potential electric arc flash hazards.	CEC 110.16
7		Service equipment shall be marked with the maximum available fault current. Include the date the fault current calculation was performed.	CEC 110.24(A)

General		FIRE PUMP	
Item	Branch	Requirements	Applicable Codes
1		Fire pump equipment shall comply with all requirements of NFPA 20 and CEC 695.	NFPA 20 NFPA 230.82(5) CEC 230.90(A) ex. 4 CEC 695

General		PANELBOARDS	
Item	Branch	Requirements	Applicable Codes
1		Provide ground bond between panelboards serving the same patient location.	CEC 517.14
2		Panelboards not allowed in patient care rooms unless they serve that room.	CEC 517.12(A)

General Power Supply Requirements		FIRE ALARM EMERGENCY COMMUNICATIONS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety	Fire alarm power on the life safety branch. Also includes booster power supplies (BPS), fire alarm terminal cabinets (FATC), electric water flow devices, and automatic fire and smoke detection devices.	CEC 517.32(C)(1) CEC 517.42(C)(1)
2	Life Safety	Communication systems used for issuing instructions during emergency conditions.	CEC 517.32(D) CEC 517.42(D)

General		ESSENTIAL POWER BRANCH CIRCUITS	
Item	Branch	Requirements	Applicable Codes
1	Essential	Branch circuits serving emergency lighting and power circuits shall not be part of a multiwire branch circuit.	CEC 700.19

General		RACEWAYS AND CABLES	
Item	Branch	Requirements	Applicable Codes
1		Non-metallic raceways are not permitted for use in patient care areas of health care facilities.	CEC 517.13(A) CEC 517.30(C)(3)(1)
2	Essential System	Schedule 40 PVC conduits used for essential system wiring shall be encased in minimum of two inches of concrete. <i>Note: Not required for skilled nursing facilities.</i>	CEC 517.30(C)(3)(2)
3	Life Safety Critical	Listed flexible metallic conduit and listed metal sheathed cable assemblies are permitted for use in any of the following: a) Where used in listed prefabricated medical headwalls b) In listed office furnishings c) Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage d) Where necessary for flexible connection to equipment	CEC 517.30(C)(3)(3)
4		Non-metallic sheathed cable (i.e. NM, NMC, Romex) is not permitted for use in patient areas, emergency system wiring, or structures of Type I and Type II construction without a conduit.	CEC 334.12 CEC 517.13 CEC 517.30(C)(3)
5		Flat conductor cable (FCC) is not permitted for use in health care facilities.	CEC 324.12(4)
6		Low voltage cables for fire alarm, nurse call, communication systems, etc. are not required to be in conduit if the power supplies are 'power limited' and the conductors are listed for such use.	CEC 517.30(C)(3)(5) CEC 517.80 CEC 725 CEC 760 CEC 800

General		LIGHTING	
Item	Branch	Requirements	Applicable Codes
1		Separation of 24 inches (horizontal distance) for switch or outlet boxes in fire rated walls and partitions.	CBC 714.3.2 ex. 1.1
2		Artificial lighting levels shall be per the <i>Illuminating Engineers Society of North America (IESNA) Lighting Handbook</i> for OSHPD 1, 2, 3, & 4 and ANSI/IESNA RP-28, <i>Recommended Practice for Lighting and the Visual Environment for Senior Level For OSHPD 2</i> .	CEC 517.22(A) and (B) OSHPD PIN 13 - <i>Lighting System Retrofit</i>
3		Lamps shall be protected against accidental breakage.	CEC 517.22(C)
4		Flexible metal conduit permitted for connection to light fixtures.	CEC 330 CEC 348.20(A)(2)(c) CEC 410
5		Wiring of the life safety and critical branch shall be allowed to share the same raceway, box, or cabinet, with the normal branch if in an exit sign or emergency system power luminaire supplied by two sources.	CEC 517.30(C)(2) and (3) CEC 517.41(D)(2) and (3)
6		Light switches shall not be within 5 feet of the perimeter of shower stalls and bathtubs.	CEC 404.4
7	Life Safety	Switching restrictions for light fixtures on the life safety branch.	CEC 517.32(A) CEC 517.42(A) CEC 700.20
8		Provide means to disconnect all ungrounded conductors in a multi-wire branch circuit.	CEC 210.4(B)
9	Essential	Light switches supplied from the essential electrical system shall have a distinctive color or marking as to be readily identifiable.	CEC 517.30(E) CEC 517.41(E)
10	Essential	Where emergency illumination is provided by one or more directly controlled luminaires that respond to an external control input to bypass normal control upon loss of normal power, such luminaires and external bypass controls shall be individually listed for use in emergency systems.	CEC 700.24

General		GROUNDING	
Item	Branch	Requirements	Applicable Codes
1		Panelboard grounding and bonding.	CEC 517.14 CEC 517.19(D)
2		Generator grounding.	CEC 250.34 CEC 250.35
3		Fixed equipment in patient care areas.	CEC 517.13(B)
4		Provide redundant ground path for branch circuits in patient care areas.	CEC 517.13(B)
5		Isolated power systems.	CEC 517.19(F) CEC 517.19(G)
6		X-Ray and diagnostic equipment grounding	CEC 517.78

General		Coordination	
Item	Branch	Requirements	Applicable Codes
1		Overcurrent protective devices serving the essential electrical system shall be coordinated for the period of time that a fault's duration extends beyond 0.1 second.	CEC 517.30(G)

		ELEVATORS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety	Cab lighting, controls, communications, and signal systems.	CEC 517.32(G) CEC 517.42(G)
2	Life Safety	Separate branch circuit for car (cab) lights, receptacles, auxiliary power, lighting source, and ventilation for each elevator car. Overcurrent device located in elevator machinery room.	CEC 620.22(A)
3		Dedicated branch circuit for HVAC equipment. Overcurrent device located in elevator machinery room.	CEC 620.22(B)
4	Normal, Equipment, or Critical	Pit lighting and receptacle.	CEC 620.24
5	Critical	Dedicated branch circuits for lighting and receptacles in the machine room.	CEC 517.33(A)(8)(n) CEC 517.43(A)(7) CEC 620.23
6		Overcurrent protection of control wiring: 18 AWG not over 7 amps, 16 AWG not over 10 amps, 14 AWG or larger per CEC 310.15.	CEC 620.61(A) CEC 725.23
7		Motor duty classified as intermittent.	CEC 430.33 CEC 620.61(B)(1)
8		Disconnecting means for all power sources.	CEC 620 Part VI
9	Equipment	Automatic or manual connection for at least one elevator.	CEC 517.34(B)(2)
10	Equipment	Where interruption of normal power would result in elevators stopping between floors, throw-over facilities shall be provided to allow the temporary operation of any elevator for the release of passengers.	CEC 517.34(B)(2)
11	Critical	For Skilled Nursing Facilities: delayed automatic or manual connection to essential electrical power for all elevators to allow the release of passengers.	CEC 517.43(B)(2)
12	Life Safety	The building corridors shall be so lighted that the illumination at the landing sills, when an elevator is in service, shall be not less than 10 foot-candle.	ASME A17.1-2007 2.11.10.2

		CORRIDORS HALLWAYS ENTRANCES EXITS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety	Emergency system power for egress illumination. Minimum of one foot-candle.	CEC 517.32(A) CEC 517.42(A) CBC 1006.2
2	Life Safety	Switch control for emergency egress illumination.	CEC 517.32(A) CEC 517.42(A) CEC 700.20
3	Life Safety	Exit sign requirements.	CEC 517.32(B) CEC 517.42(B) CBC 1011
4	Life Safety	Automatic doors in egress paths. <i>Note: Not required for skilled nursing facilities.</i>	CEC 517.32(H)
5	Equipment	Automatic doors not used for building egress. <i>Note: Not required for skilled nursing facilities.</i>	CEC 517.34(B)(5)

		MOBILE MEDICAL FACILITIES	
Item	Branch	Requirements	Applicable Codes
1		Feeder and disconnect for mobile medical facilities.	CEC 517.24

		RECEPTACLES	
Item	Branch	Requirements	Applicable Codes
1		Hospital grade receptacles in patient bed locations, procedure rooms, and operating rooms.	CEC 517.18(B) CEC 517.19(B)(2) CEC 517.61(C)(2)
2		Hospital grade receptacles not required in sleeping areas in nursing homes.	CEC 517.18(B) ex. 3
3		Tamper resistant covers in pediatric locations	CEC 517.18(C)
4		Receptacles in patient care areas shall be provided with a green insulated copper grounding conductor.	CEC 517.13(B)(1)(1)
5		Branch circuits serving patient bed locations shall not be part of a multi-wire branch circuit.	CEC 517.18(A) CEC 517.19(A)
6		Provide means to disconnect all ungrounded conductors in a multi-wire branch circuit.	CEC 210.4(B)
7		GFCI for receptacles and fixed equipment in wet locations.	CEC 517.20(A)
8		GFCI for receptacles in bathrooms, kitchens, sinks, indoor wet locations, locker rooms with associated showering facilities, on roofs, and outdoor areas.	CEC 210.8(B)
9		GFCI protection is not required for sink receptacles located in patient bed locations.	CEC 210.8(B) ex. 2 to (5)
10		GFCI protection shall not be required for receptacles located in critical care areas where the toilet and basin are installed within the patient room.	CEC 517.21
11		GFCI receptacle located within 25 feet of all heating, ventilation air-conditioning and refrigeration equipment. Receptacle shall be located on the same level as the equipment. Receptacle shall not be connected to the load side of the equipment disconnected means.	CMC 301.4 CEC 210.63
12		GFCI receptacles within 6 feet of therapeutic tubs.	CEC 680.62(E)
13		No receptacles within 5 feet of the perimeter of shower stalls or bathtubs.	CEC 406.9(C)(1)
14		Special purpose receptacles in critical care areas.	CEC 517.19(H)
15		Separation of 24 inches (horizontal distance) for switch or outlet boxes in fire rated walls and partitions.	CBC 714.3.2 ex. 1.1

		RECEPTACLES	
Item	Branch	Requirements	Applicable Codes
16	Essential	Receptacles supplied from the essential electrical system shall have a distinctive color or marking as to be readily identifiable.	CEC 517.30(E) CEC 517.41(E)
17		Isolated ground receptacles shall not be installed within a patient care vicinity.	CEC 517.16

		NURSE CALL SYSTEM - ACUTE CARE HOSPITAL	
Item	Branch	Requirements	Applicable Codes
1	Critical	Nurse call system.	CEC 517.33(A)(5)
2		Wireless nurse call systems permitted if they comply with the 7th edition or later of UL 1069.	CEC 517.33(A)(5)
3		Nurse call components.	CEC 517.123
4		Nurse call device location requirements. Refer to CBC Table 1224.4.6.5 on page 14.	CEC 517.123 CBC Table 1224.4.6.5

		NURSE CALL SYSTEM - SKILLED NURSING FACILITY	
Item	Branch	Requirements	Applicable Codes
1	Life Safety	Nurse call system.	CEC 517.42(C)(3)
2		Wireless nurse call systems permitted if they comply with the 7th edition or later of UL 1069.	CEC 517.42(C)(3) ex.
3		Nurse call components.	CEC 517.123
4		Nurse call device location requirements. Refer to CBC Table 1224.4.6.5 on page 14.	CEC 517.123 CBC Table 1224.4.6.5
5		For Skilled Nursing Facilities: two-way voice communication is required unless the system has a resetting function at the calling station.	CEC 517.123(B)(1) ex.

**2016 California Building Code Table 1224.4.6.5
[OSHPD 1, 2, 3, and 4] Location of Nurse Call Devices**

Key: 'X' Required

Area Designation	Patient Station	Bath Station	Staff Emergency Station	Code Call Station	Nurse Master Station	Duty Station	Notes
------------------	-----------------	--------------	-------------------------	-------------------	----------------------	--------------	-------

Nursing Units

Nursing Unit bed location	X						1, 2, 3, 4
Patient toilets		X					2
Patient showers and baths		X					2
Critical care bed locations, including NICU	X		X	X			1, 2, 4, 5
LDR/LDRP rooms	X		X	X			1, 2, 3, 4
Newborn and special care nurseries			X	X			
Examination/treatment room			X			X	

Support Areas

Nurse/control station					X		
Clean workroom						X	
Soiled workroom						X	
Medication preparation room						X	
Staff lounge						X	

Diagnostic and Treatment Areas

Psychiatric seclusion ante/exam rooms			X				
Cesarean delivery rooms			X				2
Emergency exam, treatment, triage rooms	X		X	X			1, 2, 4
Observation unit patient station			X				
Operating rooms			X				2
Preoperative patient care area	X		X				1, 2
Recovery-PACU			X	X			2, 4
MRI, CT, stress testing areas			X	X			2, 4
Diagnostic radiology, fluoroscopy, and ultrasound procedure rooms			X				2
Cardiac catheterization, interventional imaging, angiography			X	X			
Nuclear medicine procedure room			X				2
Endoscopy procedure room			X				2
Electroconvulsive therapy procedure room			X				

Notes:

- One device shall be permitted to accommodate both patient station and emergency staff assistance functionality.
- A visible signal shall be activated in the corridor at the patient's door, at the nurse/control station, and at all duty stations. In multicorridor units, additional visible signals shall be installed at corridor intersections.
- Two-way voice communication shall be provided with the nurse/control station.
Exception: Skilled nursing facilities.
- One device shall be permitted to accommodate both emergency staff assistance and code call station functionality.
- A patient station shall not be required in the NICU.

ACUTE CARE HOSPITAL REQUIREMENTS

Electrical System		SYSTEM SEGREGATION, SERVICE EQUIPMENT, ELECTRICAL/MECHANICAL ROOMS, TELEPHONE EQUIPMENT ROOMS, DATA ROOMS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety Critical Equipment	The essential electrical system shall comprise of the equipment branch, life safety branch, and critical branch.	CEC 517.30(B)
2	Life Safety Critical Equipment	Minimum of one transfer switch per essential electrical system branch required. [One transfer switch allowed for the essential electrical system rated for 150kVA or lower]	CEC 517.30(B)(2)
3	Life Safety	Life safety branch wiring shall be independent of all other wiring and equipment except as allowed by code.	CEC 517.30(C) CEC 700.9
4	Critical	Critical branch wiring shall be independent of all other wiring and equipment except as allowed by code.	CEC 517.30(C) CEC 700.9
5		Essential services may originate or pass through existing facilities provided they are seismically conforming facilities.	CEC 517.4 CBC 1224.4.1
6		Load verification required for all modifications to existing systems.	OSHPD PIN 38 - <i>Electrical Load Capacity Verification Guideline</i> CEC 220
7	Critical	At least one receptacle and light fixture in electrical and mechanical rooms.	CEC 517.33(A)(8)(n)
8	Normal	Ground-fault protection required on solidly grounded wye electrical service main or feeder 1000 ampere or greater for LG voltage > 150V. Additional level of ground fault protection required on downstream feeders. This includes upgrades of existing facilities.	CEC 230.95 CEC 215.10 CEC 517.17
9	Life Safety	No other function than those listed in this Code section are allowed to be connected to the life safety branch of the emergency system.	CEC 517.32
10		Hospital normal and essential electrical system power sources are allowed to serve non-OSHPD buildings on the same site provided the buildings can be disconnected in case of an emergency.	CEC 517.30(B)(4)
11	Critical	Task illumination and at least one receptacle in data and telephone rooms to be on emergency system.	CEC 517.33(A)(7)
12	Equipment	HVAC equipment serving telephone equipment and/or data equipment rooms and closets to be on the equipment branch.	CEC 517.34(A)(8)
13	Essential	Location of essential electrical system components to minimize risk of damage and interruptions due to natural forces.	CEC 517.35(C) CBC 1616A.1.42
14	Essential	A listed surge protection device shall be installed in or on all emergency systems switchboards and panelboards.	CEC 700.8

Essential Electrical System		GENERATOR FUEL SUPPLY TRANSFER SWITCHES	
Item	Branch	Requirements	Applicable Codes
1		Alternate source of power shall be a generator.	CEC 517.35(B)
2	Life Safety	Selected receptacles and battery back-up light fixtures at generator set and transfer switch locations.	CEC 517.32(E)
3	Life Safety Critical	Automatic restoration of power within 10 seconds.	CEC 517.31 CEC 700.12
4	Life Safety	Generator set accessories and required accessories(battery charger, jacket warmer, fuel pumps, etc.) as required.	CEC 517.32(F) CEC 700.12(B)(4)
5		On site fuel supply for at least 24 hours of operation at full demand. For NPC-5, at least 72 hours.	CEC 700.12(B)(2) exception 1
6	Equipment	Means for automatically transferring from one fuel supply to another when using dual fuel supply.	CEC 700.12(B)(3)
7	Equipment	Fuel transfer pump shall be on essential electrical system.	CEC 700.12(B)(2) CEC 517.34(C)
8	Life Safety Critical Equipment	Minimum of one transfer switch per essential electrical system branch required. [One transfer switch allowed for the essential electrical system rated for 150kVA or lower]	CEC 517.30(B)(4)
9		Automatic transfer switches shall have bypass isolation capability with an in-phase monitor relay.	CEC 517.30(B)(5) and (6)
10		Separately derived grounding systems shall require four pole transfer switches.	CEC 250.35(A) CEC 250.30
11		Overcurrent protection.	CEC 445.12
12		Separate generator room.	CBC 432.2.3
13		Remote generator shut-off for 10HP (7.5kW) or more units.	NFPA 37 9.2.1 NFPA 110 5.6.5.6
14		Generators shall not be located below the higher of the Design Flood Elevation (DFE) or Base Flood Elevation (BFE) plus two feet and shall be located at an elevation close to grade for easy accessibility from outside for maintenance.	CBC 1616A.1.42

Mechanical Equipment		HVAC, SUMP PUMPS, MEDICAL AIR, MEDICAL GAS CHILLER ROOMS, SMOKE CONTROL SYSTEMS, PLUMBING FIXTURES, ISOLATION ROOMS	
Item	Branch	Requirements	Applicable Codes
1	Equipment	Heating ventilating, cooling, and plumbing equipment required by the California Mechanical Code (CMC) and California Plumbing Code.	CEC 517.34 CMC 320.0 CEC 517.34(A)(9)
2	Equipment	All supply, return, and exhaust fans required for positive or negative pressure.	CMC 321.4 CEC 517.34(A)(6)
3	Critical	Alarms systems for monitoring negative pressure isolation rooms and positive pressure isolation rooms.	CEC 517.33(A)(11) CMC 321.6
4	Equipment or Critical	Delayed automatic connection for medical and surgical central suction including controls.	CEC 517.34(A)(1)
5		All control components, and control system necessary for the normal operation of equipment required to have essential electrical power.	CMC 321.5
6	Equipment	Delayed automatic connection for sump pumps and other equipment required to operate for the safety of major apparatus including associated controls and alarms.	CEC 517.34(A)(2)
7	Equipment or Critical	Delayed automatic connection for medical and surgical compressed air systems including controls.	CEC 517.34(A)(3)
8	Equipment	Stair pressurizations systems.	CEC 517.34(A)(4)
9	Equipment or Critical	Fire smoke dampers, and accordion folding fire doors.	CEC 517.34(A)(4)
10		Emergency shutdown switch for chiller equipment located immediately outside room.	CMC 1108.3 CFC 606.9.1
11		Light fixture and switch at or near equipment requiring servicing installed under floor or attic spaces.	CEC 210.70(C)
12	Life Safety	Refrigerant leak detection alarm for chiller rooms.	CFC 606.8 CEC 517.32(C)(3)
13	Life Safety	Medical gas alarm system.	CEC 517.32(C)(2)
14	Critical	Sensor-operated plumbing fixtures as required by Table 4-2 of the California Plumbing Code.	CEC 517.33(A)(10)

		FOOD PREPARATION AREA KITCHENS NOURISHMENT	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(8)(m)
2	Critical	At least one receptacle.	CEC 517.33(A)(8)(m)

		CLEAN UTILITY ROOMS SOILED UTILITY ROOMS CENTRAL SUPPLY	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(8)(m)
2	Critical	At least one receptacle.	CEC 517.33(A)(8)(m)
3		Nurse call duty station in soiled and clean utility rooms.	CBC Table 1224.4.6.5

		BLOOD, BONE AND TISSUE BANKS HUMAN PHYSIOLOGY LABORATORY	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(6) CEC 517.33(A)(8)(g)
2	Critical	At least one receptacle.	CEC 517.33(A)(6) CEC 517.33(A)(8)(g)
3	Equipment	Laboratory fume hoods.	CEC 517.34(A)(6)

		MEDICATION PREPARATION AREA PHARMACY	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(3)(b) CEC 517.33(A)(3)(c)
2	Critical	At least one receptacle.	CEC 517.33(A)(3)(b) CEC 517.33(A)(3)(c)
3	Critical	Self-contained medicine dispensing unit that require power.	CEC 517.33(A)(3)(b) CBC 1224.14.2.8.2
4	Equipment	Laboratory fume hoods.	CEC 517.34(A)(6)

		STERILE COMPOUNDING PHARMACIES HAZARDOUS AND NON-HAZARDOUS DRUGS	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination and receptacles	CEC 517.33(A)(3)(b) CEC 517.33(A)(3)(c)
2	Critical	Hoods, laminar airflow workbenches, biological safety cabinets, barrier isolators, and refrigerators.	CEC 517.33(A)(9)
3	Critical	Self-contained medicine dispensing unit that require power.	CEC 517.33(A)(3)(b) CBC 1224.14.2.8.2
4	Equipment	Ventilation equipment and controls	CEC 517.34(B)(1.1) CMC 321.5

		NURSE STATION CONTROL STATION/DESK	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(3)(g)
2	Critical	At least one receptacle.	CEC 517.33(A)(3)(g)
3		Nurse call master station.	CBC Table 1224.4.6.5

General Care Areas		PATIENT BEDROOM ANTEPARTUM BEDROOM POSTPARTUM BEDROOM LABOR ROOM LABOR RECOVERY ROOM	
Item	Branch	Requirements	Applicable Codes
1	Normal Critical	Normal and critical branch power circuits serving each patient bed location. All branch circuits from the normal system shall originate from the same panelboard. Normal branch circuit is not required if patient bed location is served by two critical branch circuits feed from two separate transfer switches.	CEC 517.18(A) CEC 517.18(A) ex. 3
2	Normal Critical	Minimum of eight receptacles serving each patient bed location, split between normal and critical branch power or split between two critical branches as allowed in CEC 517.18(A) exception 3.	CEC 517.18(B) CEC 517.33(A)(8)(a)
3	Critical	Task illumination.	CEC 517.33(A)(8)(a)
4		Nurse call patient station.	CBC Table 1224.4.6.5
5		Nurse call bath station for patient toilets, showers, and baths. Pull cords shall extend to a maximum of 12 inches above the floor.	CBC Table 1224.4.6.5 CEC 517.123(C)

Critical Care Area		INTENSIVE CARE UNIT CRITICAL CARE AREAS	
Item	Branch	Requirements	Applicable Codes
1	Critical	Normal and critical branch power circuits serving each patient bed location. All branch circuits from the normal power system shall originate from the same panelboard. Normal branch circuit is not required if critical care patient bed location is served by two critical branch circuits fed from two separate transfer switches.	CEC 517.19(A) CEC 517.19(A) ex. 2
2	Critical	A minimum of one dedicated critical branch circuit serving only that patient bed location.	CEC 517.19(A)
3	Normal Critical	Minimum of fourteen receptacles serving each patient bed location, split between normal and critical branch or split between two critical branches.	CEC 517.19(B)(1) CEC 517.19(B)(2)
4	Critical	Task illumination	CEC 517.33(A)(8)(h)
5		Nurse call patient station, staff emergency station, and code call station.	CBC Table 1224.4.6.5
6		Nurse call bath station for patient toilets, showers, and baths. Pull cords shall extend to a maximum of 12 inches above the floor.	CBC Table 1224.4.6.5 CEC 517.123(C)

Procedure		LITHOTRIPSY	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(8)(j)
2	Critical	At least one receptacle.	CEC 517.33(A)(8)(j)
3		Nurse call staff emergency station.	CBC Table 1224.4.6.5
4	Critical	Patient lift.	CEC 517.33(A)(8)(j)
5		Where the lithotripsy procedure is a wet procedure, the power system must inherently limit the possible ground-fault current to a low value or interrupt the power supply if the ground-fault current exceeds a value of 6mA.	CEC 517.20(A)

Radiology		FLUOROSCOPY, CT SCANNER, X-RAY DIAGNOSTIC EQUIPMENT, MAMMOGRAPHY, IMAGING, MRI	
Item	Branch	Requirements	Applicable Codes
1		Disconnecting means.	CEC 517.72
2		Disconnecting means not required for portable equipment served by 120 volt receptacle rated 30A or less.	CEC 517.72(C)
3		Rating of overcurrent protection and supply conductors.	CEC 517.73
4		Grounding .	CEC 517.78
5		Nurse call staff emergency and code call station for MRI, CT, and stress testing areas.	CBC Table 1224.4.6.5
6	Critical or Equipment	The fluoroscopy equipment in the hospital designated fluoroscopy room is recommended to be connected to the essential electrical system.	CBC 1224.18.1
7	Critical	Task illumination in the hospital designated fluoroscopy room	CEC 517.33(A)(9)
8		Nurse call staff emergency station for diagnostic radiology, fluoroscopy, and ultrasound procedure rooms.	CBC Table 1224.4.6.5

		HEMODIALYSIS	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(8)(e)
2	Critical	At least one receptacle.	CEC 517.33(A)(8)(e)

Critical Care Area		LABOR/DELIVERY/RECOVERY (LDR) LABOR/DELIVERY/RECOVERY/POSTPARTUM (LDRP)	
Item	Branch	Requirements	Applicable Codes
1		Normal and critical branch power circuits serving each patient bed location. All branch circuits from the normal power system shall originate from the same panelboard. Normal branch circuit is not required if critical care patient bed location is served by two critical branch circuits feed from two separate transfer switches.	CEC 517.19(A) CEC 517.19(A) ex. 2
2		A minimum of one dedicated critical branch circuit serving only that patient bed location.	CEC 517.19(A)
3	Normal Critical	Minimum of fourteen receptacles serving each patient bed location, split between normal and critical branch or split between two critical branches.	CEC 517.19(B)(1) CEC 517.19(B)(2)
4	Critical	Task illumination.	CEC 517.33(A)(8)(h)
5		Nurse call patient station, staff emergency station, and code call station.	CBC Table 1224.4.6.5
6		Nurse call bath station for patient toilets, showers, and baths. Pull cords shall extend to a maximum of 12 inches above the floor	CBC Table 1224.4.6.5 CEC 517.123(C)
7	Normal Critical	Minimum of six receptacles serving the infant resuscitation location, split between normal and critical branch.	CEC 517.19 CBC 1224.32.3.5

		NURSERY	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(3)(a)
2	Critical	At least one duplex receptacle.	CEC 517.33(A)(3)(a)
3		One duplex receptacle shall be provided for every two bassinets.	CEC 517.18(D)
4		Nurse call staff emergency and code call station.	CBC Table 1224.4.6.5

Critical Care Area		NEONATAL INTENSIVE CARE UNIT (NICU)	
Item	Branch	Requirements	Applicable Codes
1		Illumination level at a minimum of 100 foot candles. Dimmer or multi-level switching allowed.	CEC 517.22(D)(2)
2	Critical	Task illumination.	CEC 517.33(A)(8)(h)
3	Critical	A minimum of one dedicated critical branch circuit serving only that patient bed location.	CEC 517.19(A)
4	Critical Normal	Minimum of fourteen receptacles split between normal and critical branch.	CEC 517.19(B)(1)
5		Nurse call patient, staff emergency, and code call station.	CBC Table 1224.4.6.5

Operating Room, Special Procedure Room, Anesthetizing Area		OPERATING ROOM, DELIVERY ROOM CAESAREAN SECTION ROOM, TRAUMA ROOM, ANGIOPLASTY, CARDIAC CATH LAB, CYSTOSCOPY, LASER OPERATING, INTERVENTIONAL RADIOLOGY, ANESTHETIZING AREA	
Item	Branch	Requirements	Applicable Codes
1		Battery-powered emergency light fixtures with a minimum of a 90 minute runtime. Sufficient light shall be provided in order to terminate the procedure.	CEC 517.63(A) NFPA 99 6.3.2.2.11.1 NFPA 99 6.3.2.2.11.2 NFPA 99 6.3.2.2.11.3 NFPA 99 6.3.2.2.11.4
2	Critical	Task illumination and surgical lights.	CEC 517.33(A)(1) CBC 1224.32.3.4
3	Critical	Areas to be considered Wet Procedure Locations unless determined otherwise by the facility.	CBC 407.10 NFPA 99 6.3.3.3.8.4
4	Critical	Minimum of thirty-six receptacles, of which at least twelve are fed from the normal branch or a critical branch on a different transfer switch.	CEC 517.19(C)
5	Critical	Fixed electrical equipment.	CEC 517.33(A)(1)
6	Critical or Battery	Electric clocks.	CEC 517.33(A)(8)(I) CBC 1224.32.3.3
7		Grounding and bonding.	CEC 517.19(C) & (D) CEC 517.62
8		Wiring and equipment in non-hazardous area.	CEC 517.61(C) CEC 517.63
9		Isolated power systems (if required due to wet procedure determination).	CEC 517.160
10		Nurse call staff emergency station in operating rooms, cesarean delivery rooms, and procedure rooms.	CBC Table 1224.4.6.5
11		Nurse call staff emergency and code call station in cardiac cath lab, interventional radiology, and angiography.	CBC Table 1224.4.6.5

		EMERGENCY ROOM EMERGENCY EXAM ROOM EMERGENCY TREATMENT ROOM EMERGENCY TRIAGE ROOM	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.33(A)(8)(f)
2	Critical	Minimum of one receptacle.	CEC 517.33(A)(8)(f)
3		Nurse call patient station, staff emergency station, and code call station.	CBC Table 1224.4.6.5

Critical Care Area		RECOVERY ROOM POST-ANESTHETIC CARE UNIT (PACU) PRE-OP	
Item	Branch	Requirements	Applicable Codes
1		Normal and critical branch power circuits serving each patient bed location. All branch circuits from the normal power system shall originate from the same panelboard. Normal branch circuit is not required if critical care patient bed location is served by two critical branch circuits feed from two separate transfer switches.	CEC 517.19(A) CEC 517.19(A) ex. 2
2		A minimum of one dedicated critical branch circuit serving only that patient bed location.	CEC 517.19(A)
3	Normal Critical	Minimum of fourteen receptacles serving each patient bed location, split between normal and critical branch or split between two critical branches.	CEC 517.19(B)(1)
4	Critical	Task illumination.	CEC 517.33(A)(8)(h)
5		Nurse call patient and staff emergency station for pre-op. Staff emergency and code call for PACU.	CBC Table 1224.4.6.5
6		Nurse call bath station for patient toilets, showers, and baths. Pull cords shall extend to a maximum of 12 inches above the floor.	CBC Table 1224.4.6.5 CEC 517.123(C)
7		Battery-powered emergency light fixtures for task lighting with a minimum of a 90 minute runtime. *Note: Applies to PACU areas that are also used for pre-op functions.	CEC 517.63(A) NFPA 99 6.3.2.11.1 NFPA 99 6.3.2.11.2 NFPA 99 6.3.2.11.3 NFPA 99 6.3.2.11.4

ACUTE PSYCHIATRIC HOSPITAL REQUIREMENTS

ACUTE PSYCHIATRIC HOSPITAL			
<i>Acute psychiatric care facilities must comply with the requirements for acute care hospitals except as modified below.</i>			
		RECEPTACLES IN PATIENT CARE AREAS EMERGENCY GENERATOR FUEL SUPPLY NURSE CALL SYSTEM	
Item	Branch	Requirements	Applicable Codes
1		Receptacles are not required in psychiatric security rooms.	CEC 517.18(B) ex. 2
2		On-site fuel supply shall provide a minimum of six hours of operation at full demand load.	CEC 700.12(B)(2) ex. 2
3	Critical	Task illumination	CEC 517.33(A)(3)(e)
4		Nurse call not required in psychiatric units. If a nurse call system is provided, the following requirements shall apply: <ul style="list-style-type: none"> a. Provisions shall be made for easy removal or for covering of call button outlets. b. All hardware shall have tamper-resistant fasteners. c. Cords at all call stations designated for psychiatric patient use shall be detachable. 	CEC 517.123(F)

SKILLED NURSING FACILITY REQUIREMENTS

Electrical System		SYSTEM SEGREGATION SERVICE EQUIPMENT ELECTRICAL/MECHANICAL ROOMS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety Critical	The essential electrical system shall comprise the life safety and critical branches.	CEC 517.41(A)
2	Life Safety Critical	Minimum of one transfer switch per essential electrical system branch required. [One transfer switch allowed for the essential electrical system rated for 150kVA or lower]	CEC 517.41(B)
3	Life Safety	Branch wiring shall be independent of all other wiring and equipment except as allowed by code.	CEC 517.41(D) CEC 700.10
4		Essential services may originate or pass through existing facilities provided they are seismically conforming facilities	CEC 517.4 CBC 1224.4.1
5		Load verification required for all modifications to existing systems.	OSHPD PIN 38 - <i>Electrical Load Capacity Verification Guideline</i> CEC 220
6	Critical	At least one receptacle and light fixture in electrical and mechanical rooms.	CEC 517.43(A)(7)
7	Normal	Ground fault protection required on service main or feeder 1000 ampere or greater for LG voltage > 150V. Additional level of ground fault protection required on downstream feeders. This includes upgrades of existing facilities.	CEC 230.95 CEC 215.10 CEC 517.17
8	Life Safety	No other function than those listed in this Code section are allowed to be connected to the life safety branch of the emergency system.	CEC 517.42

Essential Electrical System		GENERATOR FUEL SUPPLY TRANSFER SWITCHES	
Item	Branch	Requirements	Applicable Codes
1		Alternate source of power shall be a generator.	CEC 517.44(B.1)
2	Life Safety	Selected receptacles and light fixtures at generator set location.	CEC 517.42(F)
3	Life Safety	Automatic restoration of power within 10 seconds	CEC 517.42 CEC 700.12
4		On site fuel supply for at least 6 hours of operation at full demand. <i>Note: Fuel supply requirement is the same for sub-acute facilities.</i>	CEC 700.12(B)(2) exception 2
5	Critical	Means for automatically transferring from one fuel supply to another when using dual supply.	CEC 700.12(B)(3)
6	Critical	Fuel transfer pump shall be on essential electrical system power.	CEC 700.12(B)(2)
7	Life Safety Critical	Minimum of one transfer switch per essential electrical system branch required. [One transfer switch allowed for the essential electrical system rated for 150kVA or lower] <i>Note: Bypass isolation is not required for facilities that are not providing sub-acute care.</i>	CEC 517.30(B)(5) CEC 517.41(B)
8		Separately derived grounding systems shall have transfer switches that switch all current carrying conductors and neutral conductor.	CEC 250.35 CEC 250.30
9		Overcurrent protection	CEC 445.12
10		Separate generator room	CBC 432.2.3
11		Remote generator shut-off for 10HP (7.5kW) or more units.	NFPA 37 9.2.1 NFPA 110 5.6.5.6

Mechanical Equipment		HVAC SUMP PUMPS CHILLER ROOMS SMOKE CONTROL SYSTEMS MEDICAL GAS ALARM PLUMBING FIXTURES	
Item	Branch	Requirements	Applicable Codes
1	Critical	Heating, ventilating, and cooling equipment required by the California Mechanical Code (CMC).	CEC 517.43(B)(1.1) CMC 326.0
2	Critical	All supply, return, and exhaust fans required for positive or negative pressure.	CMC 326.4 CEC 517.43(B)(1.1)
3	Critical	Delayed automatic connection for sump pumps and other equipment required to operate for the safety of major apparatus including associated controls and alarms.	CEC 517.43(A)(2)
4	Critical	Fire smoke dampers, accordion folding fire doors, and stair pressurizations systems.	CEC 517.43(A)(3)
5		Emergency shutdown switch for chiller equipment located immediately outside room.	CMC 1108.3 CFC 606.9.1
6		Light fixture and switch at or near equipment requiring servicing installed under floor or attic spaces.	CEC 210.70(C)
7	Life Safety	Refrigerant leak detection alarm for chiller rooms.	CFC 606.8 CEC 517.42(C)
8	Life Safety	Medical gas alarm system.	CEC 517.42(C)(2)
9	Critical	Sensor-operated plumbing fixtures as required by Table 4-2 of the California Plumbing Code.	CEC 517.43(A)(8)
10	Critical	Heating equipment serving all patient areas (patient bed locations, operating rooms, etc.).	CEC 517.43(B)(1.1)

		NURSE STATION MEDICATION PREPARATION AREA PHARMACY DISPENSING AREA CRITICAL BRANCH RECEPTACLE PATIENT ROOM RECEPTACLE	
Item	Branch	Requirements	Applicable Codes
1	Critical	Task illumination.	CEC 517.43(A)(1)
2	Critical	At least one receptacle on emergency.	CEC 517.43(A)(1)
3	Critical	Self-contained medicine dispensing unit refrigerator that require power.	CEC 517.43(A)(1)(a) CBC 1225.5.2.4.5
4	Critical	Selected receptacles in patient room corridors so that any patient bed can be reached with fifty (50) foot extension cord. <i>Note: Not required if each bed location is served by receptacles complying with CEC 517.18(A) and CEC 517.18(B).</i>	CEC 517.43(A)(6)
5		Receptacles in patient rooms not required to be hospital grade.	CEC 517.18(B) ex. 3

		DINING AND RECREATION AREAS	
Item	Branch	Requirements	Applicable Codes
1	Life Safety	Light fixtures on life safety branch to provide illumination to exit ways in dining and recreation areas.	CEC 517.42(E)

		RECEPTACLES	
Item	Branch	Requirements	Applicable Codes
1	Essential	Nonlocking-type, 125V, 15amp and 20amp receptacles shall have an illuminated face or an indicator light to indicate that there is power to the receptacle.	CEC 517.41(E)

SUB-ACUTE CARE NURSING FACILITY REQUIREMENTS

		SUB-ACUTE CARE NURSING FACILITY	
Item	Branch	Requirements	Applicable Codes
1		Sub-acute care nursing facilities and units electrical systems shall comply with the requirements of CEC Part III, CEC 517.30 through CEC 517.35.	CEC 517.40(B)
2		Automatic transfer switches shall have bypass isolation capability with in an-phase monitor relay.	CEC 517.30(B)(5)
3		Sub-acute care patient rooms shall comply with hospital general care patient room requirements.	CEC 517.18
4		Fuel supply shall provide a minimum of six hours operation at full demand load.	CEC 700.12(B) Ex. 2
5		Conversion of skilled nursing facilities to sub-acute nursing facilities will require full current code compliance.	OSHPD CAN 3-517.40(B) - <i>Electrical Life-Support Equipment for Nursing Homes and Limited Care Facilities</i>

CLINIC REQUIREMENTS

		AMBULATORY SURGICAL CLINIC HEMODIALYSIS CLINIC	
Item	Branch	Requirements	Applicable Codes
1		Ambulatory surgical clinics shall meet the requirements of CEC 517.30 through CEC 517.35.	CEC 517.45(F)
2		Clinics with life support equipment and/or critical care areas shall meet the requirements of CEC 517.30 through CEC 517.35.	CEC 517.45(B) CEC 517.45(C)
3		Ambulatory surgical clinic essential electrical system shall be supplied by a generator with a minimum of four hours of on-site fuel.	CEC 517.45(D.1) CEC 700.12(B)(2) Ex. 3
4		Automatic transfer switches shall have bypass isolation capability with in an-phase monitor relay.	CEC 517.30(B)(5)
5		Hemodialysis clinic shall have egress lighting and exit signs with at least ninety minutes of battery backup.	CEC 517.45(G)