

## **2007 Electrical Plan Review Reminder list**

- 1. Provide a complete or partial Single Line Diagram of the electrical system; show sizes/ratings of affected panels/switchboards, feeders, and feeder overcurrent protection. [T24, 1-7-125.c.5.K]
- 2. Provide a partial riser diagram of the system; show sizes and types of conductors, conduit, etc. [T24, 1-7-125]
- 3. Specify raceway type. [T24, 1-7-125(b)]
- 4. Specify conductor type. [T24, 1-7-125(b)]
- 5. Indicate that the governing electrical code is the 2005 NEC with 2007 California Amendments, also known as the 2007 California Electrical Code.
- 7. The Electrical Engineer/Architect of Record shall stamp and sign all electrical plans and specifications. [T24, 1-7-115(b)(2)]
- 8. Show the location of the affected or indicated equipment/item. [T24, 1-7-125(a)]
- 9. Confirm (i.e. provide existing equipment rating) that the indicated equipment is a replacement in kind (same ratings). If not, please submit complete construction document drawings showing work to be done and an electrical specification. [T24, 1-7-125, and 1-7-125(c)(6)]
  
- 11. Show feeder size, including the size, type and quantity of conductors, conduit, and overcurrent protection. [T24, 1-7-125(c)(5)(D)]
- 12. Verify/provide circuit homerun. [T24, 1-7-125(c)(5)(E)]
- 13. Provide equipment name.
- 14. Provide load name for the indicated load.
- 15. Provide key plan, showing area of work. [T24, 1-7-125(a)]
- 16. In order to facilitate the backcheck review, please submit a letter signed by the Electrical Engineer of Record, accompanying the revised plans and specifications responding to OSPHD's numbered comments. In the letter, please identify the comment by drawing sheet number and the comment number; and specify how and where on the resubmitted drawings, specification, or calculations the comments have been resolved.
  
- 17. Wiring is in a loop.
- 18. By 'E' Sheet, provide a list of circuits modified/added on an 8 ½ x 11 paper.
- 20. Show north (arrow) point of reference on all plans. [T24, 1-7-125(c)(9)]
- 22. Clearly define what is the new work in the scope of the project, and what are the existing conditions that remain. [T24, 1-7-125(a)]
- 24. Provide a panel schedule with tabulated loads. [T24, 1-7-125(c)(5)(J)]
- 25. Provide plans showing all wiring modifications. [T24, 1-7-125(c)(5)]
- 26. Show point of connection. [T24, 1-7-125]
- 27. Provide or clarify the rating for the indicated equipment. [T24, 1-7-125(c)(6) and CEC 110.3]
  
- 28. If affected area has been approved, provide a reference drawing with OSHPD stamp. Otherwise provide information on plans to prove OSHPD compliance has been met. [T24, 1-7-125(a)]
- 30. Show function, occupancy, or usage of each room, area or space on all plans. [T24, 1-7-125(a)]
- 31. Show the scale of each drawing. [T24, 1-7-125(c)(8)(E)]
- 34. Provide complete electrical specifications. [T24, 1-7-125(c)(6)]
- 36. Temporary power is not reviewed by OSHPD. Clearly indicate temporary power is removed prior to completion of project. [T24, 1-7-125(a)]
- 37. Submit complete construction document drawings showing work to be done. [T24, 1-7-125]

## **Chapter 1-General:**

- 1. All equipment to be installed or permanently connected (hardwired) must be listed, labeled, or certified by a Nationally Recognized Testing Laboratory (NRTL). [OSHPD Code Application Notice (CAN) 3-110-2, CEC 110.2]
- 2. Indicate equipment is used in accordance of the listing. [CEC 110.3(b)]
- 3. Provide the interrupting rating of the equipment and the available fault current at the equipment terminals. [CEC 110.9, CEC 110.10]
- 4. Equipment shall be marked (listed/labeled) as suitable for installation and use with higher temperature rated conductors at the ampacity of the higher rated conductors. Refer to the UL Electrical Construction Material Directory for circuit breakers, switches, panelboards, switchboards, etc. [CEC 110.14(c)]
- 5. Location of the panelboard behind the door does not permit ready and safe operation and maintenance of the equipment. Please relocate. [CEC 110.26]
- 6. Provide sufficient access and working clearance about the electrical equipment in accordance with CEC 110.26(A).
- 7. Provide access and entrances to working space about electrical equipment in accordance with CEC 110.26(C).
- 8. Provide task illumination for the work space about the electrical equipment. [CEC 110.26(D)]

## **Chapter 2-Wiring and Protection:**

- 1. Receptacles shall be installed only on circuits of the voltage class and current for which they are rated. [CEC 210.21(B)]
- 2. Receptacle outlets in bathrooms, commercial and institutional kitchens, outdoors in public places, outdoors for servicing HVAC equipment, and on roofs shall have ground-fault circuit-interrupter protection. [CEC 210.8(B)]
- 3. Show the rating of the overcurrent device for the indicated branch circuit. [CEC 21.20]
- 4. Indicate the NEMA configuration of the special purpose receptacle. [CEC 210.21]
- 5. Outlet device(s) installed on a branch circuit shall have a rating in accordance with CEC 210.21(B).
- 6. Provide a 125 volt service receptacle within 25 feet and on the same level as the heating, air-conditioning, and refrigeration equipment. Do not connect the receptacle to the load side of the equipment disconnecting means. [CEC 210.63]
- 7. Provide at least one wall switch-controlled lighting outlet at or near the heating, air-conditioning, and refrigeration equipment located in an attic or under-floor space. The wall switch shall be located at the point of entry to the attic or underfloor space. [CEC 210.70(C)]
- 8. Provide ground fault protection for the indicated feeder/equipment. [CEC 215.10]  
The continuous load on the indicated branch circuit exceeds 80% of the rating of the overcurrent device. Confirm that the overcurrent device is 100% rated. [CEC 210.20(A)]
- 10. For a specific appliance or load, the outlet load shall be computed in accordance with CEC 220.14.
- 11. For each circuit modified, indicate the revised load. [PIN 3-220]
- 12. Provide the demand factors used. [CEC 220]
- 13. Feeder conductors shall have sufficient ampacity to supply the load served. [CEC 215.2(A)]
- 14. The feeder overcurrent device is not adequately rated for the connected load. [CEC 215.3]
- 15. The connected load on the indicated feeder exceeds 80% of the rating of the feeder overcurrent device. Either confirm the overcurrent device is 100% rated or provide CEC 220 demand calculations demonstrating that an overload condition does not exist. [CEC 215.3]

- 16. The non-continuous load plus 125% of the continuous load on the indicated feeder exceeds the rating of the feeder overcurrent device. [CEC 215.3]
- 17. Provide calculations to demonstrate that there is not an overload condition on the feeder neutral. [CEC 220.61]
- 18. The load shown does not match that shown on Sheet #XX. Please correct.
- 19. Provide a load summary detailing existing load, load added, load removed, net load addition/reduction. For net load additions, on a panel/circuit, provide load capacity verification in accordance with OSHPD Policy Intent Notice (PIN) File No. 3-220.
- 20. For each panel/circuit with a net load increase:
  - 1. Perform load capacity verification in accordance with OSHPD Policy Intent Notice (PIN) 3-220.
  - 2. Provide the ratings of the panel/circuit, and overcurrent device.
- 21. If connected loads on the indicated equipment are primarily motors and/or X-ray loads, the 3-day recording ammeter reading is not an acceptable means for verifying load capacity. Provide calculations or a one-year ammeter reading (if demand data for a one-year period does not exist, the option of performing a 30-day ammeter reading per CEC 220.35 is acceptable) in accordance with OSHPD Policy Intent Notice (PIN) File No. 3-220. If connected loads on the indicated equipment are not primarily motors and/or X-ray loads, provide a note on the drawing stating this fact.
- 22. Demonstrate that the means used to verify load capacity for the indicated equipment is in accordance with OSHPD Policy Intent Notice (PIN) 3-220. (i.e., Please indicate if using 72 hour ammeter recording.)
- 23. Provide the ratings of the panel, its feeder, and feeder overcurrent device to verify load capacity. [OSHPD Policy Intent Notice (PIN) 3-220].
- 24. Indicate the load as connected or a peak demand taken by a 72-hour ammeter (or one year) reading at 125%. [PIN 3-220 and CEC 220.87].
- 25. Provide load justification for next upstream panelboard/switchboard. [PIN 3-220].
- 26. Indicate, on plans, the dates, the 72-hour ammeter reading occurred on.
- 27. Building shall be served by only one service. [CEC 230.2]
- 28. Service conductors shall not be installed in the same raceway or cable with other conductors. [CEC 230.7]
- 29. Show the location of the electrical service entrance feeder and equipment on the plan. [CEC 230.70(A) and T24, 1-7-125(c)(5)(A)]
- 30. The service disconnecting means for the fire pump shall be installed sufficiently remote from the normal service disconnecting means. [CEC 230.72(B)]
- 31. Panel schedule indicates single pole circuit breaker.
- 32. The conductors indicated do not appear to be adequately protected. [CEC 240.4]
- 33. The derated conductors (ampacity) do not appear to be adequately protected. [CEC 240.4 and CEC 310.15(B)(2)]
- 34. Indicate fuse/circuit breaker size. [CEC 240.6]
- 35. Provide ground fault protection for the building disconnecting means (277Y/480 volt feeder, rated 1000 amps or more). [CEC 230.95 and 240.13]
- 36. Clarify how compliance with CEC 240.21 is being achieved for the indicated conductors.
- 37. Provide grounding for the generator and/or transformer. [CEC 250.30]
- 38. Provide grounding electrode system in accordance with CEC 250.24(D), 250.30(A)(3) and 250.68.
- 39. If the emergency system (generator) is a separately derived AC system, provide 4-pole automatic transfer switch(es). [CEC 250.30]
- 40. Indicate grounding electrode conductor size. [CEC 250.66]
- 41. The equipment grounding conductor size is inadequate for the grounding raceway and equipment. [CEC 250.122]

### **Chapter 3-Wiring Methods and Materials:**

- 1. Provide a box or fitting at each conductor splice connection point for the connection of raceways. [CEC 300.15]

- 2. Indicate the number and size of conductors plus conduit size. [CEC 300.17]
- 3. The size of the conduit appears inadequate for the size and number of conductors. [CEC 300.17]
- 4. Penetrations of pipes, conduits, etc., in walls requiring protected openings shall be fire stopped. Fire stop material shall be a tested assembly approved by the OSHPD Fire Marshal. [CEC 300.21]
- 5. Show conduit and conductor sizes for circuits. [CEC 310.15 and 300.17]
- 6. The derated conductors do not have the minimum ampacity rating required for the connected load. [CEC 310.15(B), Note #2(a), CEC 210.19 or CEC 215.2(A)(1)]
- 7. The derated conductors do not appear to be adequately protected against an overload condition. [CEC Table 310.15(B), Note #2(a) and CEC 240.4]
- 8. Flat Conductor Cable (FCC) is not allowed inside hospital buildings. [CEC 324.12]
- 9. Rigid nonmetallic conduit shall not be used for branch circuits serving patient care areas in health care facilities. [CEC 352.12(G)]
- 10. Indicate how box size is sufficient to provide space for all conductors and devices enclosed in box. [CEC 314.16]
- 11. Provide a permanent barrier(s) in the device box or a separate box to keep emergency system wiring independent of all other wiring [CEC 314.28(D) and 517.30(C)(1) or CEC 517.41(D)].
- 12. Provide a weatherproof enclosure for the indicated switch or circuit breaker. [CEC 404.4]
- 13. Indicate, on plans, existing and new piping, ducts and other foreign equipment are not over/under affected switchboards and panelboards. [CEC 110.26(F)(1)]
- 14. No piping, ducts, equipment foreign to the electrical equipment or architectural appurtenances are permitted in the dedicated space for switchboards and panelboards. [CEC 110.26(F)(1)] Please confirm, i.e., a note on the drawing stating/assuring that no piping, ducts, equipment foreign to the electrical equipment or architectural appurtenances shall be installed in the dedicated space for switchboards and panelboards; or a confirmation letter (signed by the electrical engineer of record) stating that based on a field investigation, there are no piping, ducts, equipment foreign to the electrical equipment or architectural appurtenances in the dedicated space for the switchboards and panelboards per CEC 110.26(F)(1).
- 15. Wall spaces in patient care rooms shall not be used for the installation of switchboards and panelboards, unless dedicated for that room. [CEC 517.12(A)]
- 16. All panelboards shall have a rating not less than the minimum feeder capacity for the load computed in accordance with CEC 220. [CEC 408.36]
- 17. The indicated lighting and appliance branch-circuit panelboard is not protected in accordance with CEC 408.36.
- 18. Indicate overcurrent protection size for panelboard/switchboard. [CEC 408.36]

#### **Chapter 4-Equipment for General Use:**

- 1. Indicate that lighting fixtures are listed for wet/damp location. [CEC 410.4(A)]
- 2. Indicate that lighting fixtures are listed for use as a raceway. [CEC 410.31]
- 3. Provide weatherproof receptacle enclosure. [CEC 406.8]
- 4. For permanently connected appliances rated greater than 300 voltamperes or 1/8 horsepower, provide a disconnecting means within sight of the appliance or confirm that the disconnecting means is capable of being locked in the open position. [CEC 422.31(B)]
- 5. The indicated motor branch circuit conductors do not appear to be adequately rated. [CEC 430.22(A)]
- 6. Indicate how motor overload protection is provided. [CEC 430, Part III]
- 7. The rating of the motor branch-circuit, short-circuit protective device exceeds the maximum allowed. [CEC 430.52]
- 8. The rating of the motor feeder short-circuit protective device exceeds the maximum allowed. [CEC 430.62]

- 9. A disconnecting means shall be located within sight of the controller location and shall disconnect the controller. [CEC 430.102(A)]
- 10. Provide a disconnecting means within sight of the motor or confirm that the controller disconnecting means is capable of being locked in the open position. [CEC 430.102(B)].
- 11. Provide power factor justification or the KVA demand load shall not exceed the Generator KW rating.
- 12. Provide overcurrent protection for the generator. [CEC 445.12]
- 13. The rating of the conductors from the generator to the first overcurrent device must be at least 115% of the nameplate current rating of the generator. [CEC 445.13]
- 14. Clarify how transformer primary and secondary overcurrent protection is provided. [CEC 450.3, 240.4]
- 15. The indicated transformer does not appear to be adequately protected. [CEC Table 450.3(B)]

### **Chapter 5-Special Occupancies:**

- 1. The indicated area is a hazardous (classified) location. Confirm that all the installation of all equipment, material, and wiring in this area meets minimum requirements of CEC 500 through 504.
- 2. No essential services (normal power, emergency power, nurse call, fire alarm, communications, data systems, etc.) are allowed to originate in, or pass through or under a building that does not meet the structural requirements of CBC 1224.4.1 Clarify which structures are seismically conforming and which structures are seismically non-conforming. [CEC 517.4, CBC 1224.4.1]
- 3. Provide an insulated copper grounding conductor for receptacles and fixed electric equipment in patient care areas. [CEC 517.13(B)]
- 4. Provide a raceway type or cable type that meets the minimum requirements of CEC 517.13(A) or CEC 517.61(C) for all branch circuits serving patient care areas.
- 5. Flexible metal conduit is only permitted for use in patient care areas if the following conditions are met:
  - 1. The total length in any ground return path is less than 6 feet.
  - 2. The conduit is terminated in fittings approved for grounding.
  - 3. Branch circuit is rated 20 amps or less.
  - 4. An insulated copper grounding conductor is provided. [CEC 348.12 and CEC 250.118(5)]
- 6. Non-metallic raceways are not permitted to be used for branch circuits serving patient care areas. [CEC 517.13(A)]
- 7. Surface metal raceways used in patient care areas must be listed as an equipment grounding conductor and installed with the insulated copper grounding conductor required by CEC 517.13(B). Provide confirmation (letter from manufacturer, material product sheet, etc.) that SMR is listed as an equipment grounding conductor.
- 8. Bond together the ground busses of normal and essential electrical system panelboards serving the same individual patient vicinity in accordance with CEC 517.14.
- 9. Ground and identify "Isolated Ground" receptacles in patient care areas with an isolated ground conductor and equipment ground conductor per CEC 517.13(B); Provide an orange color or orange triangle on the face of the receptacle and a permanent mounted sign that reads "Caution-Not For Patient Equipment Use" at each receptacle. [OSHPD Code Application Notice (CAN) 3-517-16].
- 10. Provide ground fault protection on feeders one level downstream from a required ground fault protected service disconnect. [CEC 215.10, 230.95 and 517.17(B)]
- 11. Provide at least two branch circuits (one normal or equipment and one critical) to each patient bed location. [CEC 517.18(A)]
- 12. Provide four single (or two duplex) hospital grade receptacles at each patient bed location. [CEC 517.18(B)]
- 13. Provide tamper resistant receptacles in pediatric rooms. [CEC 517.18(C)]

- 14. Provide one critical branch circuited, duplex receptacle for every two bassinets in the infant nurseries. [CEC 517.18(D) and CEC 517.33(A)(3)(a)]
- 15. Provide at least two branch circuits (one normal or equipment system and one dedicated critical branch) at each critical care patient bed location. [CEC 517.19(A)]
- 16. Provide six single (or three duplex) hospital grade receptacles at each critical care patient bed location. [CEC 517.19(B)]
- 17. Provide ten single (or five duplex) hospital grade receptacles at each NICU, ICU and CCU patient bed location. [CEC 517.19(B), Exception No.1]
- 18. Provide artificial illumination in all rooms and passageways. [CEC 517.22(A)]
- 19. Provide footcandle illumination levels in accordance with the latest edition of the IES Handbook in the indicated area. [CEC 517.22(B)]
- 20. Provide footcandle illumination calculations indicating that the lighting levels in the indicated area are in accordance with the latest edition of the IES Handbook. [CEC 517.22(B)]
- 21. Clarify how lamps in the indicated fixture are protected against accidental breakage. [CEC 517.22(C)]
- 22. Indicate, on plans, how lamps in the indicated fixture are protected against accidental breakage. [CEC 517.22(C)]
- 23. Provide dimmer control or other means of multiple switching for lighting in NICU. [CEC 517.22(D)(2)]
- 24. Provide an illumination level of 100 footcandles at each infant bed location in NICU. [CEC 517.22(D)(2)]
- 25. Provide dimmer control or other means of multiple switching for lighting at each individual bed area in ICU and/or CCU. [CEC 517.22(D)(3)]
- 26. Indicate on plans or specifications, how receptacles, light switches, and boxes on the essential electrical system are identified. [CEC 517.23]
- 27. Provide a service receptacle that is listed and rated for its use for the Mobile Medical Facility Unit. [CEC 517.24(B)]
- 28. Provide a disconnecting means listed and rated for its use and located adjacent to and within sight of the service receptacle for the Mobile Medical Facility Unit. [CEC 517.24(C)]
- 29. Provide one transfer switch for each branch of the essential electrical system when the demand is greater than 150 KVA. [CEC 517.30(B)(4)]
- 30. All automatic transfer switches in general acute care hospitals shall have provisions for electrically by passing and isolating the transfer switch. [CEC 517.30(B)(7)]
- 31. Segregate the essential electrical system in accordance with CEC 517.30(B).
- 32. Please designate branches and panelboards as "life safety," "critical," and "equipment system" for segregated existing essential electrical systems (ESS). [CEC 517.30(B)] If not segregated, please provide a general note on the drawing stating that the existing essential electrical system is not segregated in accordance with CEC 517.30(B).
- 33. Clarify which system the indicated circuit is on, IE., life safety branch, critical branch, equipment system, nonsegregated emergency or nonessential system. [CEC 517.30(B)]
- 34. For future connection to a segregated essential electrical system (EES), please segregate the EES at the branch circuit panelboard level for this project, i.e., provide separate panels for life safety branch loads, critical branch loads, and equipment system loads as applicable. Designate new and existing panelboards as life safety branch, critical branch or equipment system as applicable. [CEC 517.30(B)]
- 35. Emergency system wiring shall be kept independent of all other wiring. [CEC 517.30(C)(1)]
- 36. The wiring of the emergency system of a hospital shall be mechanically protected by installation in nonflexible metal raceways, schedule 80 rigid non-metallic conduit, or shall be type MI cable. [CEC 517.30(C)(3)]
- 37. Where emergency system conductors (not serving branch circuits in patient care areas) are installed underground in Schedule 40 PVC, the conduit shall be encased by not less than 2 inches concrete. [CEC 517.30(C)(3)(2)]
- 38. Verify that the capacity of the emergency generator is adequate for the demand load [CEC 517.30(D.1)].

- 39. The emergency system shall automatically be restored to operation within 10 seconds after interruption of the normal source. [CEC 517.31 and 700.12]
- 40. Only those loads listed in CEC 517.32 are permitted on the Life Safety Branch.
- 41. Verify if the existing emergency system is segregated such that there is a designated life safety branch. If so, connect the indicated equipment to the life safety branch. If not, provide a separate circuit for life safety branch loads to facilitate connection to a future segregated life safety branch. [CEC 517.32]
- 42. Illumination of means of egress shall be supplied by the life safety branch. [CEC 517.32(A)]
- 43. The indicated lighting is assumed to be illumination of means of egress, since this is the only lighting that is permitted to be connected on the life safety branch. Switching arrangements or requirements shall comply with CEC 517.32(A), CEC 700.20 or egress lighting shall remain unswitched.
- 44. Alarm and alerting systems shall be supplied by the life safety branch. [CEC 517.32(C)]
- 45. Fire alarm equipment shall be supplied by the life safety branch. [CEC 517.32(C)(1)]
- 46. Medical Gas alarms shall be supplied by the life safety branch. [CEC 517.32(C)(2)]
- 47. Communication systems, where used to issue instructions during emergency conditions shall be supplied by the life safety branch. [CEC 517.32(D)]
- 48. Automatically operated doors used for building egress shall be supplied by the life safety branch. [CEC 517.32(G)]
- 49. Provide task illumination and selected receptacles at the generator set location supplied by the life safety branch. [CEC 517.32(E)]
- 50. Elevator cab lighting, control, communication, signal, and seismic systems shall be supplied by the life safety branch. [CEC 517.32(F)]
- 51. Connect the equipment to the life safety branch. [CEC 517.32]
- 52. Provide selected receptacles circuited on the critical branch. [CEC 517.33(A)]
- 53. Connect the equipment to the critical branch. [CEC 517.33(A)]
- 54. Connect the surgical light to the critical branch. [CEC 517.33(A)(1)]
- 55. Provide task illumination circuited on the critical branch. [CEC 517.33(A)]
- 56. Nurse call system shall be supplied by the critical branch. [CEC 517.33(A)(5)]
- 57. Where electric clocks are required by T24, Part 2, CCR, they shall be circuited on the critical branch. [CEC 517.33(A)(8)(l)]
- 58. Provide critical branch circuit(s) for minimal lighting and at least one receptacle in each mechanical and electrical room. [CEC 517.33(A)(8)(n)]
- 59. Provide critical branch circuits to sensor operated fixtures when used to comply with CPC Table 4-2. [CEC 517.33(A)(10)]
- 60. Provide critical branch task illumination and selected receptacles in the indicated area. [CEC 517.33(A)]
- 61. Provide an equipment system power source for the central suction system serving medical and surgical functions, including controls. [CEC 517.34(A)(1)]
- 62. Provide an equipment system power source for the sump pumps including associated control systems and alarms. [CEC 517.34(A)(2)]
- 63. Provide an equipment system power source for the air compressors serving medical and surgical functions, including controls. [CEC 517.34(A)(3)]
- 64. Provide an equipment system power source for the indicated item. [CEC 517.34]
- 65. Provide an equipment system power source for selected elevators. [CEC 517.34(B)(2)]
- 66. Provide an equipment system power source for the supply, return, and exhaust ventilating systems serving the indicated area requiring positive or negative pressure. [CEC 517.34(A)(6), CMC 316.0, and CMC Table 4-A]
- 67. Provide an equipment system power source for the ETO (ethylene oxide) sterilizer exhaust fan. [CEC 517.34(A)(6)]
- 68. Provide an equipment system power source for the laboratory fume hood exhaust fan. [CEC 517.34(A)(6)]
- 69. Provide an equipment system power source for automatically operated doors. [CEC 517.34(B)(5)]

- 70.** Provide an equipment system power source for the electrically heated autoclaving equipment. [CEC 517.34(B)(6)]
- 71.** Segregate the essential electrical systems in accordance with CEC 517.41(A).
- 72.** Indicate which system circuit is on: (life safety branch, critical branch, non-segregated emergency or non-essential system). [CEC 517-41(a)]
- 73.** For future connection to a segregated essential electrical system (EES), please segregate the EES at the branch circuit panelboard level for this project, i.e., provide separate panels for life safety branch loads and critical branch loads as applicable. Designate new and existing panelboards as life safety branch or critical branch as applicable. [CEC 517.41(A)]
- 74.** Provide a minimum of one transfer switch for each branch of the essential electrical system when the demand is greater than 150KVA. [CEC 517.41(B)]
- 75.** It appears that the capacity of the emergency generator is inadequate for the demand load. Please verify. [CEC 517.41(C)]
- 76.** Life safety branch wiring must be kept independent of all other wiring. [CEC 517.41(D)]
- 77.** The life safety branch shall automatically be restored to operation within 10 seconds after interruption of the normal source. [CEC 517.42 and 700.12]
- 78.** Verify whether or not the existing essential electrical system is segregated such that there is a designated life safety branch. If one exists, connect the indicated equipment to the life safety branch. If one does not exist, provide separate circuit(s) for life safety branch loads to facilitate connection to a future segregated life safety branch. [CEC 517.42]
- 79.** Illumination of means of egress shall be supplied by the life safety branch. [CEC 517.42(A)]
- 80.** The indicated lighting is assumed to be illumination of means of egress, since this is the only lighting that is permitted to be connected on the life safety branch. Switching arrangements or requirements shall comply with CEC 517.42(A), CEC 700.20 or egress lighting shall remain unswitched.
- 81.** The nurse call system shall be supplied by the life safety branch. [CEC 517.42(C)(3)]
- 82.** Provide a life safety branch power source for the indicated equipment. [CEC 517.42]
- 83.** Communications systems, where used for issuing instructions during emergency conditions shall be supplied by the life safety branch. [CEC 517.42(D)]
- 84.** Provide sufficient lighting in dining and recreation areas to provide illumination to exit ways. This lighting shall be connected to the life safety branch. [CEC 517.42(E)]
- 85.** Provide task illumination and selected receptacles at the generator set location supplied by the life safety branch. [CEC 517.42(F)]
- 86.** Elevator cab lighting, control, communication, and signal systems shall be supplied by the life safety branch. [CEC 517.42(G)]
- 87.** Provide critical branch circuits to sensor operated fixtures when used to comply with CPC Table 4-2. [CEC 517.43(A)(8)]
- 88.** Provide critical branch task illumination and selected receptacles in the indicated area. [CEC 517.43(A)(1)]
- 89.** Provide a critical branch power source for the indicated equipment. [CEC 517.43(A)(2)]
- 90.** Provide selected critical branch circuited receptacles in corridors so that any patient bed can be reached with a fifty foot extension cord. [CEC 517.43(A)(6)]
- 91.** Provide critical branch task lighting and at least one receptacle in electrical and mechanical rooms. [CEC 517.43(A)(7)]
- 92.** Provide a critical branch power source for heating, ventilating, and cooling equipment, if required by the California Mechanical Code. [CEC 517.43(B)(1.1)]
- 93.** In instances where disruption of 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. These facilities shall incorporate the use of critical branch circuitry. [CEC 517.43(B)(2)]
- 94.** Provide receptacles listed for hospital use in Inhalation Anesthetizing Locations. [CEC 517.61(C)(2)]

- 95. Provide one or more battery-powered emergency lighting in each operating room. [CEC 517.63(A)]
- 96. Provide momentary rating for x-ray equipment to verify that the rating of disconnecting means, supply conductors, and overcurrent protection meet minimum requirements. [CEC 517.72, 517.73]
- 97. Provide a disconnecting means operable from a location readily accessible from the X-ray control. [CEC 517.72(B)]
- 98. Provide a disconnecting means for the portable X-ray equipment. [CEC 517.72(B)]
- 99. Where simultaneous biplane examinations are undertaken with X-ray units, the supply conductors and overcurrent protective devices shall be 100% of the momentary demand rating of each X-ray unit. [CEC 517.73(A)(2)] Please comply and revise load calculation(s) as required.
- 100. Where therapeutic equipment is used, the ampacity of supply conductors and the rating of the overcurrent protective devices shall not be less than 100% of the current rating of the medical X-ray therapy equipment. [CEC 517.73(B)] Please comply and revise the load calculation(s) as required.
- 101. Indicate x-ray equipment is listed by a Nationally Recognized Testing Laboratory. [CEC 517.75]
- 102. Ground noncurrent carrying metal parts of X-ray and associated equipment. [CEC 517.78(C)]
- 103. Provide means for a visual signal visible from all parts of the corridor above corridor doors to each patient bedroom, toilet room and bath or shower room. [CEC 517.123(A)]
- 104. Provide a patient/nurse call station at each patient bed location. [CEC 517.123(A)(1)]
- 105. Detachable cords shall be used at all call stations in rooms designated for psychiatric patient use. [CEC 517.123(A)(3)]
- 106. Provide a staff emergency call station in the indicated area. [CEC 517-123(B)]
- 107. Provide a code blue station in the indicated area. [CEC 517.123(C)]
- 108. For code blue, provide a means for a unique visual and audible signal at the attending nurses' station and above each patient unit or room door. [CEC 517.123(C)(3)]
- 109. For code blue, provide a means for visual and audible signals at the PBX operator or other 24 hour staffed area. [CEC 517-123(C)(4)]

### **Chapter 6-Special Equipment:**

- 1. Provide a disconnecting means located within sight of the exterior electric sign. [CEC 600.6]
- 2. Provide a dedicated branch circuit for car lights and accessories on each elevator car. [CEC 620.22(A)]
- 3. Provide a dedicated branch circuit supplying air-conditioning and heating units on each elevator car. [CEC 620.22(B)]
- 4. Provide a car light and accessory circuit disconnecting means for each elevator unit. [CEC 620.53]
- 5. Provide a heating and air conditioning disconnecting means for each elevator unit. [CEC 620.54]
- 6. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in (elevator) machine rooms, machinery spaces, pits, and elevator car tops shall have ground-fault circuit-interrupter protection. [CEC 620.85]
- 7. Provide a disconnecting means for all electronic equipment in the computer/data processing equipment room. A similar means shall be provided to disconnect the power to all dedicated HVAC systems serving the room and shall cause all required fire/smoke dampers to close. The control for these disconnecting means shall be grouped and identified and shall be readily accessible at the principal exit doors. A single means to control both the electronic equipment and HVAC systems shall be permitted. [CEC 645.10]

- 8. Provide a ground-fault circuit-interrupter for the therapeutic tub and any receptacles within 5 feet. [CEC 680.62(A), 680.62(E), 517.20(A)]
- 9. Provide bonding of the tub, associated equipment and metal surfaces within 5 feet of the tub. [CEC 680.62(B), 680.62(C)]
- 10. Receptacles and light switches shall not be installed within shower rooms or stalls or be accessible from within these areas. [CEC 404.4 or 406.8(C)(1)]
- 11. Receptacles and switches are not permitted within 5 feet of the bath tub. [CEC 404.4 or 406.8(C)(1)]
- 12. Provide totally enclosed type lighting fixtures in therapeutic tub areas. [CEC 680.62(F)]
- 13. Protective devices installed in the fire pump feeder circuit (normal power) shall be set such that the device shall not open at the sum of the locked rotor currents of the fire pump motor(s), jockey pump, and associated fire pump auxiliaries. [NFPA 20, 6-3.2.2.3(a), and CEC 695.4(B)(1)]
- 14. The power sources (normal and emergency) for the fire pump shall be arranged in such a manner so that a fire at one source will not cause an interruption at the other source. [NFPA 20, 6-2.4.1 and CEC 695.3(B)(3)]
- 15. The fire pump controller shall be within sight of the fire pump. [NFPA 20, 7-2.1 and CEC 695.12(A)]
- 16. Provide a 2 inch minimum concrete envelope or an enclosure with an equivalent of one-hour fire resistance rating for feeder conductors to the fire pump not routed outside the building. [NFPA 20, 6-3.1 and CEC 695.6(B)]
- 17. All fire pump room wiring shall be installed in rigid, intermediate, liquid-tight flexible metallic conduit or Type MI Cable. [NFPA 20, 6-3.1 and CEC 695.6(E)]
- 18. Provide calculations to demonstrate that the maximum voltage drop at the fire pump motor does not exceed 5 percent, when the motor is operating at 115% of the full-load rating of the motor. [NFPA 20, 6-4 and CEC 695.7]
- 19. The voltage at the inlet terminals of the pump controller shall not drop more than 15% below the controller rated voltage, under motor starting conditions. [NFPA 20, 6-4 and CEC 695.7]

### **Chapter 7-Special Conditions:**

- 1. Provide a means for audible and visual signals indicating derangement, etc. in an attending area where personnel are familiar with the operation of the emergency equipment. [CEC 700.7]
- 2. Indicate the emergency system shall automatically be restored to operation within 10 seconds after interruption of the normal source. [CEC 700.12]
- 3. Provide calculations demonstrating that there is adequate on-site fuel storage for 24 hours full load operation of the generator. [CEC 700.12(B)(2), Exception 1]
- 4. Provide calculations demonstrating that there is adequate on-site fuel storage for 6 hours full load operation of the generator. [CEC 700.12(B)(2), Exception 2]
- 5. Show the location and/or circuitry for the generator battery/charger system. [CEC 700.12(B)(4)]
- 6. Provide an alternate source of illumination for HID type lighting fixtures connected to emergency power. [CEC 700.16]
- 7. It is permitted to use an automatic light actuated device (photo cell) to control emergency exterior lighting used as illumination of means of egress. Otherwise, switching arrangements or requirements shall comply with CEC 517.32(A), 517.42(A), CEC 700.20 or egress lighting shall remain unswitched. [CEC 700.22]
- 8. Pipes or ducts foreign to the electrical installation shall not be located in the vicinity of the service equipment and metal-enclosed switchgear rated over 600 volts. [CEC 110.34(F)]
- 9. Indicate the cable type. [CEC ARTICLE 725]
- 10. The fire alarm system shall conform to the 2007 CBC, Vol. 1, Section 308.9.

## **Chapter 8-Communications Systems:**

- 1. Indicate the cable type. [CEC ARTICLE 800]

### **CEC and CBC:**

- 1. Doors, windows, and louvered openings shall be located only on the exterior walls of the generator room. [CBC 413A.2.2]
- 2. Generator(s) shall not be located in a room or area used for any other purpose. Relocate equipment that is not essential to the operation of the engine/generator. [CBC 413A.2.3 and OSHPD Code Application Notice (CAN) File No. 2-413A.2.3]
- 3. The audible and visual alarm system to alert ETO (ethylene oxide) sterilizer operating personnel when the air flows fall below design CFM shall be connected to the critical branch. [CEC 517.33(A)(9)]
- 4. Offset outlet boxes installed back-to-back in fire-rated walls and partitions shall have a minimum separation of 24 inches horizontally. [CEC 300.21]
- 5. Electrically driven fire pumps, transfer switches and controllers shall be designed in accordance with the NFPA 20. [CBC 904.1.2]
- 6. Provide branch circuit from the life safety branch to exit signs. [CBC 1003.2.8.5 and CEC 517.32(B) or CEC 517.42(B)]
- 7. Provide minimum of one footcandle of exterior emergency exit illumination along path of egress to a public way (open parking lot, open field, public street, safe distance from the building-verify with the OSHPD Fire Marshal, etc.) supplied by Life Safety Branch. [CBC 1003.2.9.1 and CEC 517.32(A) or CEC 517.42(A)]
- 8. Provide a minimum of one footcandle of exit illumination at the floor level supplied by the life safety branch. [CBC 1003.2.9.1 and CEC 517.32(A) or CEC 517.42(A)]
- 9. Only necessary penetrations are allowed in stairways. [CBC 1005.3.3.5]
- 10. Receptacle and switch outlets shall be installed not less than 15 inches nor more than 48 inches above the floor or working platform. [CBC 1117B.6, 1118B.5, CEC 404.8(C), and CEC 406.3(G)]

### **CEC and CMC:**

- 1. Provide a positive means of disconnect adjacent to and in sight of the HVAC equipment served. [CMC 309.0]
- 2. Provide a 120 volt maintenance receptacle within 25 feet of the HVAC equipment. [CMC 309.0]

### **PINS and CANS:**

- 1. Please show (cloud/bubble) and identify (with an appropriate delta number) all the revisions made to the post approval construction document drawings under this XX (AD, CO, or IB). For all affected delta numbers, please add "AD, CO or IB # XXX" to the "Revision Descriptive Narrative." Do not remove any revisions (cloud/bubble) and delta numbers that are a part of this XX each time the documents are submitted/re-submitted for review/backcheck/approval. The affected document drawings cannot be fully reviewed, backchecked, and approved without all the revisions properly shown and identified.
- 2. Installation of the fire alarm system shall not be started until detailed plans and specifications, including California State Fire Marshal listing numbers for each component of the system have been approved by the Office of Statewide Health Planning and Development. [CAN 9-1001]
- 3. Upon completion of the installation of the fire alarm system, a satisfactory test of the entire system shall be made in the presence of the Enforcing Agency. [CAN 9-1001]

## **Fire Pump:**

- 1. The emergency overcurrent protection for the fire pump shall be sized for the instantaneous pick-up of the full fire pump room load. [NFPA 20, 6-6.1]
- 2. The dedicated transfer switch for the fire pump service shall be listed, labeled, or certified by a National Recognized Testing Laboratory for use with the fire pump. [NFPA 20, 7-8.3.1 and CAN 3-110-2]
- 3. Provide short-circuit calculations to demonstrate that the fire pump controller AIC rating is sufficient to withstand the available fault current at its terminals. [NFPA-20, 7-1.2.2]
- 4. The fire pump transfer switch shall be located within the fire pump room. [NFPA 20, 7-2.1]
- 5. Protective devices installed in the power supply circuits (normal power) at private power stations and utility service connections ahead of the fire pump feeder circuits, shall be set such that the devices shall not open at the sum of the locked rotor currents of the fire pump motor(s) and maximum plant load. [NFPA 20, 6-3.2.2.3(a)]
- 7. The size/capacity of the feeder shall be based on 125% of the sum of the full load currents of the fire pump(s), jockey pump, and fire pump auxiliary loads. [CEC 695.5(C)(1)]
- 8. When the pump room is not constantly attended, audible or visual alarms shall be provided at a point of constant attendance. [NFPA 20, 7-4.7]
- 9. The fire pump controller isolating switch shall be equipped with surge protection. [NFPA 20, 7-4.1]

### **NOTE:**

The purpose of this list is to reduce oversights and to achieve minimum levels of uniformity and completeness. The use of this reminder list does not constitute a complete plan review. Compliance with all items on this list does not necessarily assure compliance with all provisions of the applicable codes and standards. This reminder list should be used only by persons with a comprehensive knowledge of the applicable codes and standards.