



**CITY OF HUNTINGTON BEACH**  
**COMMUNITY DEVELOPMENT DEPARTMENT**  
**BUILDING DIVISION**

2000 Main Street  
Huntington Beach, CA 92648  
(714) 536-5241

**2019 CALIFORNIA ELECTRICAL CODE GENERAL CHECKLIST**

**Note:** *The list below is intended to assist the applicant by identifying the general requirements in the 2019 California Electrical Code. Please note that this list is not intended to be a full nor a complete list. Please refer to the 2019 California Electrical Code and the HBMC for all requirements.*

**PART A. GENERAL REQUIREMENTS**

1. Plans as submitted, are not complete enough for a complete plan review. Additional time will be necessary upon re-submittal and added comments may be issued.
2. Please provide a written response to all corrections or comments issued. All plan corrections should be referenced or otherwise identified to expedite re-check.
3. Please see the corrections marked in red on the checked set of plans. **Please return the checked set of plans along with 2 new corrected sets.**
4. Provide the job address, name of the owner (s), and legal description of the property on the title block of each page of the drawings.
5. Provide wet stamped/signed plans by an individual licensed for electrical design.
6. Provide note that fire alarm system is to be on a separate permit and plan.
7. Provide note that signs are to be under a separate permit and plan.
8. Huntington Beach Fire Department approval shall be obtained on the fire protection systems to ensure compliance with the Fire Code. **Fire alarm system shall be on a separate plan and permit and reviewed by the Fire Department.**
9. Provide note that all equipment shall be listed and labeled by an approved testing agency. [110.2 and 110.3]
10. Provide note that a neutral fault test is required before energizing new circuits. [250.24 (A)(5)]
11. Provide single line diagram. [215.5]
12. Provide a copy of the Planning Division's Conditions of Approval and print conditions on the plans.
13. Screening of electrical utility meters and equipment visible from the right of way is required. [HBZSO 230.76]

**PART B. GENERAL CODE REQUIREMENTS**

1. Specify the interrupting rating, withstand rating of devices, impedance of transformer(s), and line impedance per ft. [110.9 and 110.10]
2. The space equal to the width and depth of electrical equipment and extending from the floor to a height of 6 foot above the equipment or to the structural ceiling, whichever is lower shall be dedicated space for electrical equipment. [110.26 (E) (1)]
3. Provide protection from physical damage for switchboards, panel boards and other electrical equipment. [110.27 (B)]

4. Provide and maintain required work space, adequate illumination, access to work space, and head room for and about electrical equipment. [110.26]
5. For electrical equipment rated 1200 amperes or more, that contain overcurrent devices, switches, or control devices, and there is personnel door(s) intended for entrance and egress from the work space less than 25 feet, the doors shall open in the direction of egress and be equipped with panic bars, pressure plates, other devices that open under simple pressure.[110.26(C)(3)]. Where the above equipment is over 6 feet wide, all of the above requirements shall apply and, there shall be one entrance to the required work space at each end of the working space. [110.26 (C)(2)]
6. Where equipment rated 800 A or more that contains OCPD, switching devices, or control devices and there is a door for personnel use it shall swing in direction of travel and be equipped with listed panic hardware.
7. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit. Indicate the receptacle rating. [210.21 (B)(1)]
8. Other than dwelling units, all single phase receptacles rated 150 volts to ground or less, 50 amps or less and three phase receptacles rated 150 volts to ground or less, 100 amps or less installed in the following locations shall have GFCI protection: Bathrooms, kitchens, rooftops, outdoors, and where installed within 6ft. of the outside edge of a sink, indoor wet locations, locker rooms with associated shower facilities, garages, service bays, crawl spaces at or below grade level and unfinished basements. [210.8 (B)]
9. GFCI protection shall be provided for lighting outlets not exceeding 120 volts installed in crawl spaces [210.8 (E)].
10. All 125 volt, single phase, 15 and 20 ampere receptacles in commercial garage, repair, and storage areas where electrical diagnostic equipment, electric hand tools or portable lighting are to be used shall have GFCI protection.
11. At least one receptacle outlet shall be installed within 18 in. of the top of the show window for each linear 12 ft. or major fraction thereof of show window. [210.62, calculated load per 220.14 (G)]
12. Each multi-wire branch circuit shall be provided with means that will simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates [210.4 (B)]
13. All 120 volt, single phase, 15 and 20 amp branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels shall be protected by any means described in [210.12(A)(1) through (6)] [210.12 (C)].
14. At least one 125 volt single phase, 15 or 20 amp rated receptacle shall be installed in an accessible location within (25ft.) of the indoor electrical service equipment. The required receptacle shall be located within the same room or area as the service equipment [210.64].  
Exception No.1 The receptacle outlet shall not be required to be installed in one and two-family dwellings.  
Exception No.2 Where the service voltage is greater than 120 volts to ground a receptacle outlet shall not be required for services dedicated to equipment covered in Article 675 and 682.
15. Meeting rooms receptacles shall comply to [210.71]

#### **PART C. FEEDERS**

1. Correct excessive voltage drop on feeder(s). [210.19]
2. See items listed in other sections related to feeders.
3. Show length, materials, and sizes of conduits on line diagram.

#### **BRANCH CIRCUITS & FEEDER CALCULATIONS**

4. Branch circuit loads were incorrectly calculated or omitted. [220.3]

5. Correct excessive voltage drop on branch circuit(s). [ 210.19]
6. Provide a load of not less than 150 VA per each two feet of track lighting or fraction thereof. [220.43 (B)]
7. Provide proper feeder, panel board and branch circuit ampacity for general lighting as required for the particular occupancy. [220.12]
8. Provide a minimum of 1200 VA for exterior sign or outline lighting system branch circuit. [220.14 (F)]
9. Provide a dedicated branch circuit for the lighting in each elevator car. [620.22(A)]
10. Feeder loads were incorrectly calculated or omitted. [220.10]
11. Provide a minimum of 200 VA for each linear foot of show window. [220.12 (G)]
12. Feeder and branch circuit rating shall be based on not less than non-continuous loads and 125% of continuous loads. [215.2(A)]
13. Provide 180 VA of load for each general use receptacle. [220.14 (I)]
14. Banks or office buildings receptacle loads shall be calculated to be the larger of: (1) The computed load from 220.14 (A), or (2) 1 volt-ampere/ft<sup>2</sup>.
15. A fixed storage-type water heater that has a capacity of 120 gal or less shall be considered a continuous load. [422.13]

#### **PART D. SERVICES**

1. Service disconnect(s) shall be located nearest the point of entrance of the service entrance conductors. [230.70(A)(1)]
2. There shall be no more than six sets of disconnects per service grouped in any one location. [230.71(A)]
3. No more than one service disconnecting means is permitted for motor control centers. [430.95]
4. The service disconnecting means shall have a rating not less than the load to be carried determined in accordance with Article 220. [230.79]
5. The two to six disconnects as permitted in section 230-71 shall be grouped. [230.72(A)]
6. Ground-fault protection shall be provided for solidly grounded wye electrical services and feeders of more than 150 volts to ground for each service/feeder disconnect rated 1000 amperes or more. [230.95][215.10]
7. Service equipment shall have a short-circuit current rating of not less than the available short circuit current and motor(s) contribution at its supply terminals. [110.9]
8. A building or other structure shall be supplied by only one service. [230.2]
9. When more than one building or other structure is on the same property and under single management, each additional building or structure shall be supplied by only one feeder or branch circuit and shall be provided with means for disconnecting all ungrounded conductors. [225.30]
10. Means shall be provided for disconnecting all ungrounded conductors that supply or pass through the building or structure. [225.31]
11. Equipment shall not be connected to the supply side of the service disconnecting means. [230.82]
12. In a multiple-occupancy building, each occupant shall have access to their service disconnecting means. [230.72(C)]
13. Provide service load calculation. [Art. 220]

#### **PART E. OVERCURRENT PROTECTION & SHORT CIRCUIT PROTECTION**

1. Conductors shall be protected against overcurrent in accordance with their ampacities specified in 310.15. [240.4]
2. Overcurrent protection shall be provided in each ungrounded conductor and shall be located at the point where the conductors receive their supply. [240.21]

3. Fuses shall be provided with rejection type fuse holders. [240.21]
4. Provide the maximum available short circuit from So. Cal Edison. [110.9, 110.10]
5. Indicate the series combination interrupting rating of overcurrent devices. Identify the fuse class and the circuit breaker manufactures, model designation, type and electrical rating used as part of series rating. [110.9 & 240.83(C)]
6. Indicate the maximum available short circuit current at service equipment.[110.24]
7. Each occupant shall have ready access to all overcurrent devices protecting the conductors supplying that occupancy.[240.24(B)]
8. Where fuses rated 1200 Amps or higher are installed (A) and (B) shall apply. [240.67]
  - (A) Documentation shall be available to those authorized to design, install, operate or inspect the installation as to the location of the fuses.
  - (B) A fuse shall have a clearing time of 0.07 seconds or less at the available arcing current or one of the following shall be provided:
    - (1) Differential relaying
    - (2) Energy-reducing maintenance switching with local status indicator
    - (3) Energy-reducing active arc flash mitigation system
    - (4) An approved equivalent means

#### **PART F. GROUNDING & BONDING**

1. The following equipment and material shall be bonded /grounded: (1) Electrical systems that are grounded shall be effectively connected to earth. (2) Non-current carrying conductive materials enclosing electrical conductors or equipment shall be connected to earth so as to limit the voltage to ground on these materials. (3) Non-current carrying conductive materials enclosing electrical conductors or equipment shall be connected together and the electrical source to establish an effective ground fault path. (4) Electrically conductive materials that are likely to become energized shall be bonded. (5) Electrical equipment and other electrically conductive materials likely to become energized shall be grounded to create a permanent, low impedance circuit facilitating the operation of the overcurrent device or ground detection for high impedance ground systems. [250.4(A)]
2. Provide properly sized grounding electrode conductors. [250.24 & 250.66]
3. Provide a stainless steel driven grounding electrode. [HBMC 17.48.040]
4. Separately derived systems that do not have a solidly connected grounded conductor to the service-supplied grounded conductor shall be separately grounded. [250.20(D) & 250.30]
5. Where more than one building is supplied by a service, the grounded conductor supplying each building shall be adequately sized and grounded at each building or an equipment grounding conductor shall be provided from the main service to each building. [250.24(c)]
6. The building grounding electrode system shall be used as the grounding electrode for the separately derived system. If located outdoors, the grounding electrode shall be in accordance with 250.30 (C).[250.30 (A)(4)]
7. All services and separately derived systems supplying a building shall have a common grounding electrode system. [250.58 and 250.50]
8. Provide a properly sized equipment grounding conductor(s). [250.122]
9. All grounding electrodes as described in 250.52 (A)(1) – (A)(6) that are present at each building or structure shall be bonded together to form the grounding electrode system. [250.50]
10. A full sized grounding conductor shall be routed with each set of paralleled conductors. [250.122(F)]
11. Circuits serving patient care areas shall be provided with a ground fault path for fault current by installation in a metal raceway or cable having a metallic armor or sheath listed as an equipment return path in accordance with 250.118. [517.13] . Receptacles and all non current carrying

conductive surfaces of fixed electrical equipment shall be grounded by an insulated copper conductor sized per Table 250.122. [517.13(B)]

12. Intersystem bonding terminations are required to be provided external to enclosures. The size of the conductor used to establish this connection shall not be smaller than 6AWG copper. [250.94]

#### **PART G. WIRING METHODS**

1. Specify the wiring method(s) and the conductor type(s) to be used.
2. Raceways or sleeves subject to different temperatures and where condensation may be present, the raceway or sleeve shall be filled with an approved material to prevent the circulation of warm air to a colder section of the raceway or sleeve. [300.7]
3. Specify plenum rated conductors to be used in space used for environmental air distribution. [300.22]
4. Specify the depth of the underground conductors. [Table 300.5]

#### **PART H. CONDUCTORS FOR GENERAL WIRING**

1. Provide the proper wire type for use in the application. [310.10]
2. Provide the proper branch circuit/feeder conductor(s) size. [310.15(B)(16)]
3. Where the number of conductors in a raceway or cable exceeds three, the allowable ampacity of each conductor shall be adjusted per table. [310.15(B)(3)(A)]
4. Conductors or cables installed in conduits exposed to direct sunlight on or above rooftops shall have adjustments added per Table 310.15(B)(2)(a) unless conduit is installed a minimum of 7/8" from roof to bottom of conduit. [310.15(B)(3)(c)].

#### **PART I. CONDUIT, RACEWAYS, J-BOXES, LUMINAIRES, ETC.**

1. Provide proper conduit size. [Annex C]
2. Indicate type of conduit(s) to be used. [Annex C]
3. Provide adequately sized outlet, pull or junction boxes. [314.16 & 314.28]
4. Electric discharge fluorescent luminaires that utilize double ended lamps shall be provided with a disconnecting means either internal or external to each luminaire. [410.130 (G) (1)]

#### **PART J. SWITCHES, PANELS, & EQUIPMENT**

1. Switches, circuit breakers, etc. shall be readily accessible. [404.8]
2. All 15 and 20 amp, 125 and 250 volt non-locking type receptacles in the areas specified shall be tamper resistant. [406.12]
  - (1) Dwelling units in all areas specified in 210.52 and 550.13
  - (2) Guest rooms and guest suites of hotels and motels
  - (3) Child care facilities
  - (4) Preschools and elementary education facilities
  - (5) Business offices, corridors, waiting rooms and the like in clinics, medical and dental offices and outpatient facilities
  - (6) Subset of assembly occupancies described in 518.2 to include places of waiting transportation, gymnasiums, skating rinks and auditoriums
  - (7) Dormitories
3. Panelboards shall have a rating not less than the minimum feeder capacity required for the load calculated in accordance with Article 220 as applicable. [408.30]
4. Each multiwire branch circuit shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates. [210.4(B)]

5. Panelboards shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This OCPD shall be located within or at any point on the supply side of the panelboard. [408.36]
6. Provide weatherproof GFCI protected outlets within 25 feet of exterior mounted HVAC equipment. [210.63 & 210.8 (B)(3)]
7. Cord and plug connected vending machines shall include a ground-fault circuit interrupter. [422.5]
8. Electric drinking fountains shall be protected with ground-fault circuit-interrupter protection. [422.5]

#### **PART K. MOTORS**

1. Provide the nameplate rating of the following: [430.7 & Table 430.250]
  - A. Locked-rotor current of torque motors.
  - B. AC adjustable voltage motors.
  - C. Low Speed (1200 RPM or less) motors
  - D. Multi-speed motors
  - E. Non-continuous duty motors
  - F. Horsepower rating
2. Provide proper conductor size for motor(s) \_\_\_\_\_. [430.22]
3. Provide proper motor and branch-circuit overload protection. [430.31]
4. Provide proper motor branch circuit and ground fault protection (specify breaker/fuse size and type). [430.52]
5. Provide properly located disconnects on motor(s) \_\_\_\_\_. [430.102]
6. A listed surge protection device shall be installed in or on the fire pump controller. [695.15]

#### **PART L. TRANSFORMERS**

1. Provide overcurrent protection on the primary of the transformer. [450.3]
2. Provide overcurrent protection for the secondary conductors of transformer. [240.21(C)]
3. The provisions of 240.4(B) shall not be permitted for transformer secondary conductors. [240.21(C)]
4. Provide adequate ventilation in transformer rooms. [450.9]
5. Indicate transformer(s) secondary conductor length(s). [240.21(c)]
6. Specify the grounding electrode conductor size and the electrode type to be used for the transformer. [250.30]
7. The building grounding electrode system shall be used as the grounding electrode for the separately derived system. If located outdoors, the grounding electrode shall be in accordance with 250.30 (C).[250.30 (A)(4)]

#### **PART M. HAZARDOUS AREAS**

1. Provide hazardous classification by class, division or zones and group, and show boundaries of the hazardous area(s). [Art. 500]
2. This project may be located in a methane district. Verify with the Fire Prevention division (714) 536-5411 if conduit sealing is required.
3. Wiring in hazardous areas shall comply with the code provisions for those areas. ] Art.500 thru 516]
4. Provide conduit seals at boundaries of hazardous areas. [501.15]
5. Submit information of the natural or mechanical ventilation provided in garage area(s). [511.3(E)]
6. Provide GFCI protection for all 125 volt 15 and 20 ampere receptacles in repair garages. [511.12]
7. Classify the pits in the garage areas. [511.3(C)(3) and (D)(3)]

#### **PART N. EMERGENCY SYSTEMS**

1. Provide (a) properly sized emergency power source(s) for required emergency load(s). [700.4]
2. A completely independent raceway and wiring system shall be installed for emergency circuits. [700.10(B)]
3. The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied. [CBC 1008.3.2 (5)]
4. Emergency illumination shall be provided in all means of egress. [CBC 1008]
5. The means of egress illumination level shall not be less than 1 foot-candle at the walking surface. [CBC 1008.2.1]
6. Performance of system. Emergency illumination units shall be arranged to provide at least an average of 1 foot-candle and a min. of 0.1 fc measured along the path of egress. A maximum-to-minimum illumination uniformity ratio fo 40 to 1 shall not be exceeded. [CBC 1008.3.5]
7. Emergency exit illumination shall be supplied from a generator, storage battery, or a unit equipment. [CBC 1008.3.4], [700-12]
8. Emergency lighting shall be supplied from a source complying with Art 700.12. [700.17]
9. Provide a lock-on device for circuits supplying emergency unit equipment. [NFPA]
10. The branch circuit feeding the unit equipment shall be the same circuit serving the normal lighting in the area and connected ahead of any switches. [700.12(F)(2)].
11. In the event of power supply failure, an emergency electrical system shall automatically illuminate all Electrical equipment rooms, Fire command centers, Fire pump rooms, Generator rooms and Public restrooms greater than 300 square feet. [CBC 1008.3.3]

#### **PART O. STATE ENERGY REGULATIONS (Title 24, Part 6, California Code of Regulation)**

1. Submit lighting calculations on approved lighting compliance forms for new office building or additions and alteration on existing building. [ 2019 CA Energy code 141]
2. The certificates of compliance shall be signed by a qualified, licensed person responsible for its preparation prior to plan check approval. [California Administrative Code Section 10-103(a)(1)]

#### **PART P. MISC.**

1. Identify if the project is OSHPD

#### **PART Q. ADDITIONAL CORRECTIONS:**

1. See additional attached notes and respond accordingly to corrections noted.