



Electrical Plan Review Commercial Checklist

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This checklist is provided as a reference tool and it is not intended to be exhaustive of all possible electrical requirements. It may also include more items than a specific set of electrical plans may encompass.

Referenced Codes:

- *National Electrical Code (NEC) 2020
- City of Austin Electrical Ordinance No. 20200507-027 (COA)
- Austin Energy Design Criteria Manual (AEDCM)
- Com-Check 2015 IECC Compliance
- International Building Code (IBC) 2015
- National Fire Protection Association 70 (NFPA)
- AHSRAE Handbook of Fundamentals 2017 (ASHRAE)
- Texas Accessibility Standards (TAS) 2012
- International Existing Building Code (IEBC) 2015
- Land Development Code - Chapter 25-2: Zoning: Subchapter E: Section 2.5 (LDC)
- Land Development Code – Chapter 25-12: Technical Codes: Article 4 and Article 7 (LDC)
- Development Services Department Process Requirements (DSD)

*All Code Sections Are NEC Unless Otherwise Noted.

	Code Requirements	Code Section
A. General-Application and Required Documents		
1.	ESPA (Electric Service Planning Application) for new or upgraded current transformer cabinets, meter enclosures, service conductors, service equipment, and tenant's services.	AEDCM
2.	Signed approval data for projects employing meter module units that indicate type and location from Austin Energy Meter Services	AEDCM
3.	Austin Energy Design Criteria Manual (AEDCM) Compliance	AEDCM
4.	Com-Check 2015 IECC Lighting Compliance Certificate	
5.	Technical Sheets showing compliance for all outdoor luminaires.	COA Ordinance 20170606-088
6.	A complete and accurate Site Photometric Analysis	COA Ordinance 20170606-088
7.	All electrical lighting, luminaires, appliances, equipment, and electrical equipment is required to be listed/labeled by a Nationally Recognized Testing Laboratory. Provide complete and accurate manufacturer's technical sheets for all equipment that show the required information such as NRTL-Approved Marking, classification by type, size, voltage, current capacity, and specific use.	110.2, 110.3 OSHA US Department of Labor NRTL Listing
B. Submittal Plan Requirements		
8.	All buildings, structures, or tenant finish-outs in excess of 5,000 square feet shall require a drawing stamped by a licensed professional electrical engineer. Buildings, structures, or tenant finish-outs of 5,000 square feet or less shall require a drawing with the signature and license number of the qualifying master electrician of record for a State of Texas licensed electrical contractor, or stamped by a licensed professional electrical engineer.	COA Ordinance 20200928-094; TBAE Board Flowchart; TBPE Board Flowchart

	Code Requirements	Code Section
9.	Provide scalable lighting floor plan with a Reflected Ceiling drawing showing the location of all luminaries with emergency units clearly marked in their location. Specify any energy control or efficiency devices required for energy conservation standards. Specify Emergency Lighting Power Sources.	Plan Set
10.	Provide scalable power floor plan showing (locations) of: receptacles, switches, outlets, etc. Identify if new, existing, or relocated.	Plan Set
11.	Show the location and sizes of each Disconnecting Means (fusible or non), If Fusible, AFC or AIC value of protective device, size, and capacity.	Plan Set
12.	Coordinate all loads between mechanical & plumbing schedules and demand loads with electrical sheets and panel schedules	Plan Set
13.	Show the location of electric panels (new and existing)	Plan Set
14.	Provide service load calculation for all new loads and combined loads when upgrading. Show all load analysis for each sub-panel, OCPD type, and AIC rating. Include all demand factors used to determine final loads.	220.87
15.	Mark the available fault current at the service, and provide arc flash labeling 110.16	110.16 & 110.24
16.	Overcurrent protection	230.90, 230.91
17.	Protection of conductors rated over 800 amperes [240.4(C)]	110.24
18.	Feeder and service load calculations	220.40
19.	If ESPA is not approved at the time of submittal, it must be included in plan review submittal package. If Selective Coordination studies or other required testing has not been yet performed, a Deferred submittal form must be included and will defer these items until a later stage.	AE DCM and 240
20.	Provide a one-line/riser diagram detail of service's drawings of the complete electrical system showing: <ul style="list-style-type: none"> • Voltage, ampacity, phases and overcurrent devices • Conduits and conductor sizes (Feeder Schedule) • Sizes and type of wire of all grounding and bonding conductor, and grounding detail • Exterior lighting plan including fixture types, wattage, and conductor sizes • Nameplate rating for all motors, elevators, AC units and equipment Provide a panel schedule (for each sub-panel) showing the identity of the sub-panel (panel number); size of main breaker (if applicable) and total load calculations	Plan Set
21.	Identify any hazardous or classified area.	NEC Chapter 5, IBC 107.1, 107.2
22.	Provide detailed short circuit analysis including a coordination study. The analysis should reflect the three and single phase fault as well as ground fault and line to line to ground fault (when applicable).	110.9 & 10, 240.21
23.	Identify all Class 2 and Class 3 circuits.	725.41
C. Working Clearance and Dedicated Spaces		
24.	Show all working clearances for all voltage classes, panels and equipment.	110.26 (A)(1)
25.	For electrical equipment rated 1200 Amps or larger and equipment 6' wide; provide two means of egress. Also Doors w/ Panic Hardware, within 25' 24"X6.5' ENTRANCE TO AND EGRESS FROM	110.26 (B), (C)
26.	Personnel doors are equipped with listed panic hardware and open in direction of egress for equipment rated 800-amps or more and within 25ft of working space	110.26(C)(3)
27.	Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, or motor control centers installed indoor and shall not be controlled by automatic means only.	110.226(D)
28.	Dedicated space provided for electrical equipment	110.26(E)
29.	No piping, ducts or equipment foreign to electrical equipment shall be permitted to be located within the dedicated space above the electrical equipment.	110.26 (E)

	Code Requirements	Code Section
30.	Provide and maintain required work space, adequate illumination, access to work space and head room around electrical equipment.	110.26 (E) (1) (a)
31.	Any piping, ductwork or conduit is prohibited in fire rated stairwells unless associated with illumination of the stairwell or the building fire suppression system.	IBC
	D. Apartments and Dwelling Units: IBC Designed Multifamily	
32.	Show or notate all required 20A circuits. Show or notate all Receptacles for dwellings provided as required.	210.52(A)-(I)d. 210.11(C)
33.	Provide Readily Accessible ground fault circuit interrupter (GFCI) protection where required.	210.8
34.	Provide arc-fault circuit interrupter (AFCI), combination type protection as required.	210.12
35.	Tamper Resistance Receptacles: All 15 – 20 ampere, 125 volt and 250 volt non-locking-type receptacle in the areas as specified in 406.12(1) through (7) shall be listed tamper-resistance receptacles.	406.12
36.	Show Windows must be Continuous Duty at 250 VA per linear foot or actual lamp rating, include 1 outlet for Receptacles every 12' or major fraction thereof, and be within 18" of the windowsill. Track Lighting at each 24" = 150 VA at 1.25%.	220.60
37.	Receptacles for Guest rooms or guest suites in hotels, motels, sleeping rooms in dormitories, and similar occupancies provided as required	210.60 (A)
38.	Common Area Branch Circuits: Branch circuits required for the purpose of lighting, central alarm, signal, communications, or other needs for public or common areas of a two-family dwelling, a multifamily dwelling, or a multi-occupancy building shall not be supplied from equipment that supplies an individual dwelling unit or tenant space. A separate panel and meter are required for these branch circuits.	210.25(B)
39.	Provide receptacle for servicing equipment that's GFCI protected, on the same level as the equipment and readily accessible to the tradesman.	210. 63
	E. Non-Dwelling Units Designed to the IBC	
40.	Ground fault protection of equipment, rated 1000amps or more and not exceeding 600 volts phase to phase on a solidly grounded wye electrical system with more than 150 volts to ground shall be provided with ground fault protection of equipment	230.95 210.13
41.	Meeting Rooms or other similar gathering rooms, huddle rooms, training rooms, or other large rooms with center tables or that contain dry erase boards or screens for projections, where greater than 215 ft ² , but not more than 1000 ft ² , require floor receptacles. They must also comply with the counts from 210.52.	Art. 210.65(B)(2)
	F. Wiring Methods and Materials-Conduit/Conductor Fill, Raceways, J-Boxes	
42.	Provide proper conduit fill percentages. Notate any conductor insulation type in larger feeder/conduit details where larger fill values might exist. Include the GEC/EGC when calculating.	NEC Chapter 9
43.	A separate grounding conductor shall be installed in nonmetallic conduit runs.	352.60
44.	The Phase Marking of conductors and testing/approving of all equipment and fixtures, where required or permitted by this code shall be acceptable only if approved by a Nationally Recognized Testing Laboratory *NRTL and acceptable to the Authority Having Jurisdiction.	COA Ordinance 202005007-027 310.110 (C)
45.	Conductors grouped together shall be arranged so as to avoid heating the surrounding ferrous metal by induction.	300.22
46.	Comply with 250.24(C), the neutral conductor or grounded conductor shall be run from a grounded system transformer to all services and be bonded to each service disconnecting means enclosure even though all power may be utilized at line voltage only. This is required even though the service might supply only	250.36

	Code Requirements	Code Section
	line-to-line loads. (Not for high resistant grounding system: Line-to neutral loads are not served.	
47.	Building(s) or structure(s) supplied by feeder(s) or branch circuit(s) shall have a grounding electrode or grounding electrode system installed	Part III of Article 250.32 (B) or (C).
48.	Provide and show receptacle outlets for known appliances generally within 6' wherever cord connected equipment will be used	210.50 (C)
49.	Where the disconnects are not provided within sight from the equipment it supplies, the switch or circuit breaker must include provisions for adding a lock, and these provisions must remain with the equipment. These locking provisions have to be part of the equipment, either inherent to the equipment design or as an accessory feature that can be installed on the equipment.	410.141(B), 422.31(B), 424.19, 440.14 Exception No. 1, 600.6(A)(2)(3), 620.51(A) Exception No. 1, 620.53, 620.55
50.	Standard non-locking straight-blade receptacles in 120- and 250-volt configuration at wet/damp location are required to be listed weather-resistant type.	406.8 (A)
51.	Luminaires that are recessed into insulated ceiling are required to be rated for insulation contact ("IC-rated") so that insulation can be placed over them.	410
52.	Receptacles intended to supply shore power to boats shall be housed in marine power outlets listed as marina power outlets or listed for wet locations, or shall be installed in listed enclosures. All other requirements of 555 shall apply.	555
53.	In all child care, day care, foster care, or other child facilities, all non-locking type, 125V, 15- and 20-ampere receptacles shall be listed tamper-resistant receptacles.	406.14
54.	Provide switch and receptacle heights per State of Texas accessible requirements	TAAS
55.	In dwelling units and guest rooms of hotels, motels and similar occupancies, the lighting and outlet circuit voltage shall not exceed 120 volts nominal.	210.6(A)
56.	Raceway Seals: Conduits or raceways through which moisture may contact live parts shall be sealed or plugged at either or both ends.	300.5 (G)
57.	Indoor locations, other than dwellings and associated accessory structures, fluorescent luminaires fixtures shall have a disconnecting means, either internal or external to each luminaires (fixture)	410.130 (G)
58.	The line side terminals of the disconnecting means shall be guarded. The disconnecting means shall be located so as to be accessible to qualified persons before servicing or maintaining the ballast.	410.116
59.	Pools: Provide GFCI protection where required, and mark on plan set.	680.23
60.	Provide equipment grounding conductors for all pool related equipment and bond together.	680.26
61.	Show all Grounding details.	
62.	Indicate the burial depth of underground conduits and conductors and specify the cover material.	Table 300.5
63.	Conduits that are exposed to widely different temperatures, such as coolers, freezers or service entrance conductors, shall be sealed to prevent circulation of air and/or moisture.	300.7(A)
64.	Provide cable supports on vertical runs.	300.7 (A)
	G. Conductors for General Wiring	
65.	Provide the proper wire type (temperature rating and copper or aluminum) for use in the project.	310.13
66.	Where the number of conductors in a raceway or cable exceeds three, the allowable ampacity of each conductor shall be reduced	310.15(B)(3)(a)
67.	Where the conductors or cables are installed in conduits exposed to direct sunlight on or above rooftops shall be reduced	310.15(B)(3)(c)
68.	Where two different ampacities apply to adjacent portions of a circuit, the ampacity shall be per the 310.15(2) exception.	310.15(2)

	Code Requirements	Code Section
69.	Conductors size No.1 AWG and smaller with 75 degree C and 90 degree C insulation are to use the 60 degree column of the code, Table310-16, to determine ampacity. Conductors #1/0 AWG and larger with 75 degree and 90 degree insulation are to use the 75 degree column of the code, Table 310-16, to determine ampacity.	110.14.C
70.	Ensure all exterior installations of conductors have an ambient temperature consideration of a minimum of 98 degrees Fahrenheit factored in. ALL Neutral Conductors where used for more than 50% Non-Linear loads must be considered Current Carrying.	ASHRAE
71.	Adjustment factors for the number of current carrying conductors in a raceway or cable exceed three, shall be reduced, neutral conductors need to be counted	Table310.15(B)(3)(a)
72.	Where the maximum ambient temperature is over 30 C, (86 F), the referenced correction factors shall apply to conductors.	Table 310.16 to 19
H. Switches, Panels and Roof Equipment		
73.	Provide permanent access to roof mounted equipment.	240.24, 430.102, 440.14
74.	The grounded circuit conductor for the controlled lighting circuit shall be provided at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit.	404.2(C)
75.	Switches, circuit breakers, fuses shall be readily accessible.	404.8(A), 240.24, 430.102, 440.14
76.	Replacement of receptacles shall comply as applicable.	406.4(D)
77.	No circuit shall be described in a manner that depends on transient conditions of occupancy.	408.4
78.	A panelboard shall be protected by an overcurrent protective device having a rating not greater than that of the panelboard. This overcurrent protective device shall be located within or at any point on the supply side of the panelboard.	408.36
79.	Panelboards equipped with snap switches rated at 30 amperes or less shall have overcurrent protection of 200 amperes or less.	408.36(A)
80.	Circuit breakers used as switches in 120 and 277 volt fluourescent lighting circuits shall be listed and marked "SWD" or "HID".	240.83(D)
81.	Provide non-automatic lighting control(s) at electrical room(s).	110.26(D)
I. Motors		
82.	Provide a coordinated protection for the motor circuit. This coordination shall include the fault current, overload, circuit conductors and motor control apparatus.	430.225
83.	Indicate the Duty-Cycle service and design of motors. This information should include the motors duty and time rating.	430.22, Table 430.22(E)
84.	Provide proper conductor size for motor(s)	430.22, 430.24, 430.26
85.	Provide overload protection for motor(s)	430.31, 430.32
86.	Provide proper short circuit ground fault protection for motor(s). Specify breaker/fuse type.	430.52, 430.62
87.	Provide properly sized overcurrent protection for VAV- Max 15A C.B.	430.52
88.	An individual branch circuit is required for each motor over one horsepower or 6 amperes of full load current.	430.53(A)
89.	Provide properly located disconnects, types and size on motor(s)	430.102, 103, 109 & 110
90.	Provide calculation to justify the existing rating of the main breaker for the feeder short-circuit and ground-fault protection is still in compliance when new loads are added to the system.	430.62(A)
91.	Forbid 208V motors on 240V circuit	110.3(b) and 110.4
92.	All mechanical equipment and sub-duct in support of smoke control system shall be on emergency power.	?

	Code Requirements	Code Section
	J. Services	
93.	Service Equipment – Disconnecting Means shall be installed in readily accessible location either outside of a building or structure or inside nearest point of entrance of the service entrance conductors.	COA Ordinance .70 and AE Criteria Design Manual 230.71
94.	Available Fault Current shall be legibly marked on service equipment	110.24
95.	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 and an equipment grounding conductor shall be provided from the main service to each building.	250.32 & 50
96.	All services supplying a building shall have the same grounding electrode system.	250.50
97.	Provide calculation to justify the existing rating of the main breaker for the feeder short-circuit and ground-fault protection is still in compliance when new loads are added to the system.	430.62(A)
98.	Building(s) or structure(s) supplied by feeder(s) or branch circuit(s) shall have a grounding electrode or grounding electrode system installed in according with Part III of Article 250.32(B) or (C).	250.32 (B) or (C)
99.	Protection of conductors rated over 800 amperes [240.4(C)] Overcurrent protection (230.90, 230.91) Feeder and service load calculations (220.40)	240.4(C)
100.	Feeder Taps: Equipment grounding conductors run with feeder taps shall not be smaller than shown in table 250.122 based on the rating of the overcurrent device ahead of the feeder but shall not be required to be larger than the tap conductors.	250.122 (G)
101.	Include maximum available fault current for service equipment in other than dwelling units.	110.24
102.	Marking – Ungrounded systems shall be legibly marked “Ungrounded System” at the source or first disconnecting means of the system.	250.21(C)
103.	Where a circuit breaker is utilized without an instantaneous trip, documentation shall be available to those authorized to design, install, operate or inspect the installation as to the location of the circuit breaker(s). Where a circuit breaker is utilized without an instantaneous trip, one of the following or approved equivalent means shall be provided: <ul style="list-style-type: none"> • Unfused service entrance conductors extending horizontally into the building are not approved unless encased in minimum 2 inches of concrete. SCE – Service Entrance Conduits are to be encased in 2 inches of concrete when entering the building or subterranean garage.	240.87
104.	The identification of every circuit and switchboard shall be legibly included on the plan set. Provide panel schedule circuit descriptions.	Plan Set
	K. GROUNDING AND BONDING GROUNDING (Article 250)	
105.	Increased in size –equipment grounding conductors shall be increased in proportionately to the circular mill area of the ungrounded conductors.	250.122(b)
106.	Provide grounding and bonding for permanently installed pools, spas, hot tubs, and fountains.	Article 250, 680
107.	Provide properly sized grounding electrode conductors for the service(s).	250.53-66
108.	Show all Grounding Electrode system sizes, types, and connections.	250.53-66
109.	Grounded conductor to service equipment.	250.24(C)
110.	Grounding electrode system installation.	250.53
111.	Grounding and Bonding of Fences and Other Metal Structures (over 1000V). Metallic fences enclosing, and other metal structures in or surrounding, a	250.194

	Code Requirements	Code Section
	substation with exposed electrical conductors and equipment shall be grounded and bonded to limit step, touch, and transfer voltages.	
112.	<p>Metal Fences. Where metal fences are located within 16 ft. of the exposed electrical conductors or equipment, the fence shall be bonded to the grounding electrode system with wire-type bonding jumpers as follows:</p> <ul style="list-style-type: none"> • Bonding jumpers shall be installed at each fence corner and at maximum 160 ft. intervals along the fence. • Where bare overhead conductors cross the fence, bonding jumpers shall be installed on each side of the crossing. • Gates shall be bonded to the gate support post, and each gate support post shall be bonded to the grounding electrode system. • Any gate or other opening in the fence shall be bonded across the opening by a buried bonding jumper. • The grounding grid or grounding electrode systems shall be extended to cover the swing of all gates. • The barbed wire strands above fence shall be bonded to the grounding electrode system. • Alternate designs performed under engineering supervision shall be permitted for grounding or bonding metal fences. 	250.66
113.	<p>Metal Structures. All exposed conductive metal structures, including guy wires within 8 ft. vertically or 16 ft. horizontally of exposed conductors or equipment and subject to contact by persons, shall be bonded to the grounding electrode systems in the area.</p>	260.66
L. AIRCONDITIONING AND REFRIGERATION EQUIPMENT		
114.	Location of disconnecting means shall be located within sight from, the air-conditioning or refrigeration equipment. The disconnect means shall be permitted to be installed or within the air-conditioning or refrigeration equipment.	440.14
115.	Provide a relay to interlock exhaust fan with light switch at a restroom.	Energy Code
116.	Any HVAC system that serves other occupancies shall be permitted to also serve the information technology equipment room if fire/smoke dampers are provided at the point of penetration of the room boundary. Such dampers shall operate on activation of smoke detectors and also by operation of the disconnecting means required by 645.10.	645.4
M. TRANSFORMERS & SEPARATELY DERIVED AC SYSTEMS		
117.	Grounding details must be shown, Provide grounding and bonding for separately derived system per 250.30.	250.30
118.	Include the following information for each transformer listed: Label each, provide a scalable or dimensioned floor plan of each transformer's location, Nameplate data (KVA and Primary/Secondary values), Primary overcurrent protection size, Primary and Secondary Conductor ampacity rating, Provide a load analysis for the demands on the secondary side.	450.3
119.	Indicate transformer(s) secondary tap length(s).	(240.21
120.	Provide adequate ventilation in transformer room(s).	450.9
121.	Indoor dry type transformers over 112.5kVA shall be installed in minimum 1-hour fire rated room.	450.21(B)
122.	Transformers over 50kVA shall not be installed in hollow spaces, ceiling spaces of the building.	450.13(B)
123.	The secondary conductors terminate in a single circuit breaker or set of fuses that will limit the load to the ampacity of the secondary conductors. The provisions of 240.4(B) shall not be permitted for tap conductors.	Table 450.3(A), Table 450.3(B)
124.	Show the size and location of all transformer disconnecting means and notate or provide for tap length restrictions on the secondary side.	240.21

	Code Requirements	Code Section
125.	Elevated transformers on above ceiling platforms will require Primary disconnect means above ceiling adjacent to transformer or lockout device at electrical panel transformer primary circuit breaker.	445.13
126.	Transformers, other than Class 2 or Class 3, shall have a disconnecting means located either in sight of the transformer or in a remote location, the disconnecting means shall be lockable, and the location shall be field marked on the transformer.	450.14
	N. GENERATORS	
127.	Exit signs shall not be used as J-boxes. Show location of required junction boxes.	700.9
128.	A separate submittal and permit is required from the Fire Department for the generator review and approval.	AFD SOP
129.	Site Plan correction or exemption required if located exterior of a building envelope. Onsite liquid fuel storage may require Hazmat process from AFD.	AFD DSD SOP
	O. SPECIAL EQUIPMENT	
130.	A single disconnecting means and associated overcurrent protective devices shall be permitted to be installed between the fire pump power source and one of the following: <ul style="list-style-type: none"> • A listed fire pump controller • A listed fire pump power transfer switch A listed combination fire pump controller and power transfer switch	COA Elec. Ord.
131.	Where the building property is located in a flood zone area, all electrical equipment shall be installed one foot above the flood base elevation. (NOTE: in some installations such as TRU's or other exterior equipment the requirement is 2' above the prevailing high water mark).	LDC, and 626.22(B)
132.	Provide separate submittal, obtain all required permits, inspections and approvals for all fire alarm system installations and / or modifications from the Sprinkler or Alarm systems.	DSD
133.	Provide separate submittal for all electrical subsystems with power supply(s) of more than 50VA and / or 24V. (E.g., security, card readers, telco / data, PA, audio / visual, nurse call, HVAC and refrigeration controls, etc.).	CPR SOP
	P. SPECIAL CONDITIONS	
134.	Signs: A sign shall be placed at the service-entrance equipment that indicates the type and location of each on site optional standby power source.	701
135.	Busway shall be permitted to be extended vertically through dry floors if totally enclosed (unventilated) where passing through and for a minimum distance of 6ft above the floor to provide adequate protection from physical damage.	368.12(C)(2)(a)
136.	Where vertical riser penetrates two or more dry floors, a minimum 4-in high curb shall be installed around all floor openings for riser busways to prevent liquids from entering of the floor opening. Electrical equipment shall be located so that it will not be damaged by liquids that are retained by the curb.	368.12(C)(2)(b)
	Q. HEALTH CARE / Clinics and other Professional Medical	
137.	The circuits of emergency system, health care facilities and elevator system shall not be series rated because these circuits are required to be selectively coordinated.	517.17, 700.27 and 620.62.
138.	Use of general anesthesia in critical care areas where patients are subjected to invasive procedures and are connected to line operated, electro-medical devices will require an emergency power source, which requires a separate submittal and building permit.	517
139.	Comply with Article 517- All branch circuits serving patient care areas / exam rooms shall be provided with a ground path for fault current by installation in a metal raceway system or cable assembly, which shall itself qualify as an equipment grounding return path in accordance with section [250.118]. Type AC, MC and MI cable shall have an outer metal armor or sheath that is identified as an acceptable grounding return path.	517; 250.118, 330, 320

	Code Requirements	Code Section
140.	In clinic patient care areas, the grounding terminals of all receptacles and all noncurrent- carrying conductive surfaces of fixed electric equipment subject to personal contact, operating over 100 volts, shall be grounded by an insulated copper conductor. The grounding conductor shall be sized per Table 250-122 and installed with the branch circuit conductors in metal raceways per Section 517.13. Branch circuits on the plans shall identify this insulated grounding conductor.	517
141.	The wiring method in Clinic patient care areas shall be in metal raceways or cable assemblies per Section 517.13. Metallic raceways and cable sheath assemblies shall be approved as a ground path as defined in Section 250.118. Note on the plans the type of wiring method. (Caution: The following wiring methods are not allowed in these areas: Nonmetallic Cable Trays, ENT, Nonmetallic Extensions; PVC, Surface Nonmetallic Raceways.	517.13, 250.118, 318.4, 331.4, 342.4, 347.3, 352.22, 353
142.	Panel boards serving normal and essential branch circuits in clinics shall have their equipment grounding terminal busses bonded together with a minimum #10 insulated copper conductor. Identify equipment-grounding conductor on the plans.	517.14
143.	Provide a note on the plans stating that any receptacles with insulated grounding terminals in clinic patient care areas shall have identifiable means visible after installation.	517.16
144.	The circuits of emergency system, health care facilities and elevator system shall not be series rated because these circuits are required to be selective coordinated in compliance with	517.17, 700.27 and 620.62.
145.	Provide ground fault protection for feeder disconnecting means supplying power to clinics if there is ground fault protection for the service disconnecting means as required in Sections 230.95 or 215.10. The ground fault protection for such feeders shall be selectively coordinated as required by Section 517.17.	Sections 230.95, 215.10, & Section 517.17.
146.	All receptacle outlets and fixed equipment within wet location in clinics shall have GFCI protection.	517.20
147.	Fixed equipment installed in wet locations where an isolated power system is utilized, shall be listed for the purpose and installed in accordance with the provisions of Section 517.160 for Isolated Power Systems.	517.20
148.	Provide a generator with on-site fuel with a minimum capacity of 4 hours in locations with ambulatory surgical clinics. Note on the plans that power shall be restored by the generator within 10 seconds after loss of normal power.	517.50, 700.12
149.	All raceways in patient care areas require to be installed per 2016 CEC, 517.13 and 14.	517.13 and 14.
150.	Comply with Article 517 Part V for the X-Ray Installations	Article 517 Part V
151.	Equipment classified for life-support purpose shall be supplied from an essential system as required per sections.	517
152.	Provide a generator to supply all the loads in the ambulatory surgical clinics.	517.45
153.	Wiring installation within an ambulatory surgical or hemodialysis clinics shall be in accordance with 517.45(D).	517
154.	Patient care area receptacles shall be grounded by an insulated copper conductor.	517.13(B)
155.	Panelboards serving power to same patient vicinity shall be bonded together with minimum 10 AWG insulated copper conductor.	517.14
156.	Anesthetizing location? If so, design project in compliance with Article 517 Part IV (Inhalation Anesthetizing Locations).	517; PT IV
157.	The circuits of emergency system, health care facilities and elevator system shall not be series rated because these circuits are required to be selectively coordinated.	517.17, 700.27 and 620.62.
158.	Comply with Article 517- All branch circuits serving patient care areas / exam rooms shall be provided with a ground path for fault current by installation in a metal raceway system or cable assembly, which shall itself qualify as an equipment grounding return path in accordance with section [250.118]. Type	517 & 250.188/250.119

	Code Requirements	Code Section
	AC, MC and MI cable shall have an outer metal armor or sheath that is identified as an acceptable grounding return path.	
	R. POOLS, SPAS, HOTTUBS, HYDROMASSAGE BATHS:	
159.	The top rim of the spa or hot tub shall be at least 28in. above all perimeter surfaces that are within 30in. measured horizontally from the spa or hot tub. The height of nonconductive external steps for entry to or exit from the self-contained spa shall not be used to reduce or increase this rim height measurement.	680 (Check new pool spa code and TAAS rules)
160.	All pool equipment room devices including wall GFCI receptacles shall be suitable for use in corrosive environment, weatherproof enclosures.	UL Standards, AFD SOP and MEP Agreed Corrosive Locations.
161.	Outlets supplying pool pump motors connected to single-phase, 120 volt through 240 volt branch circuits whether by receptacle or by direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.	680.21(C)
	S. HAZARDOUS AREAS	
162.	Provide hazardous classification by class, division or zones and group, and show boundaries of the hazardous area(s).	Art. 500, 505
163.	Wiring in hazardous areas shall comply with the Code provisions for those areas.	Art. 500 thru 516
164.	Provide conduit seals at boundaries of hazardous areas.	501.15, 502.15, 504.70, 513.9, 514.7, 515.9
165.	Maximum permitted cross-section fill of seals shall not exceed 25% of the cross-sectional area of a conduit of the same trade size unless specifically approved.	501.15(C)(6)
166.	Submit details of the natural or mechanical ventilation provided in garage area(s).	511.3
167.	Provide GFCI protection for outlets in repair garages.	511.12
168.	Classify the pits in the garage areas.	511.3(B)
169.	Provide classification by class, division or zones and group, and show boundaries of the hazardous area(s).	500, 505
170.	Wiring in hazardous areas shall comply with the Code provisions for those areas.	500 thru 516
171.	Provide conduit seals at boundaries of hazardous areas.	501.15, 502.15, 504.70, 513.9, 514.7, 515.9
172.	Maximum permitted cross-section fill of seals shall not exceed 25% of the cross-sectional area of a conduit of the same trade size unless specifically approved.	501.15(C)(6)
173.	Provide details for hazardous location Class 1, Div. 1 / Div. 2. A seal-offs and wiring method for the electrical junction boxes at the extraction wellheads; "EYS" explosion proof fittings will be required.	500-503
174.	Plans shall show all classified boundaries at plan view(s) and elevation view(s). Indicate class and division of all hazardous areas via hatching or other approved means.	Chapter 5
175.	Provide cut sheets for any electrical equipment and or devices listed for the used at the hazardous areas.	Chapter 5
176.	All circuits (including associated power, communication, data, and video circuits) associated with motor fuel dispensing facilities require a means to simultaneously disconnect from the source of supply, including the grounded conductor, if any. Single-pole breakers utilizing handle ties shall not be permitted.	514.11 and 514.13
	T. FIRE PUMP	
177.	Fire pump circuit conduits shall be encased in no less than 2 inches of concrete.	695.6

	Code Requirements	Code Section
178.	Show the routing of the fire pump feeder.	93.0207, 695.6
179.	Overcurrent protection for fire pump services shall provide short circuit protection and shall be set to carry fire pump motor locked rotor current indefinitely.	695.4(B)(1)
180.	Provide an emergency source of power for fire pump.	695.3(B), 700.12
181.	No disconnecting means shall be installed within the fire pump feeder circuit.	695.4(A)
182.	Transfer of power shall take place within the fire pump room.	695.12(A)
183.	The disconnect means for the fire pump service is required to be remote from the normal building service disconnecting means. Labeling of this service disconnecting means must be provided, and the switch is to bear a manufacturer's marking indicating it is "suitable for use as service equipment" The switch is required to be supervised using one of the methods specified.	230.7(E), 695.4(B)(2)(1),695.4(B)(5)
184.	Because the utility supply is grounded, a grounded circuit conductor is required to be installed from the utility transformer to the fire pump service disconnecting means per 250.24(C). As specified in 250.24(C)(1), the neutral conductor size is determined by selecting from Table 250.66, based on the size of the ungrounded conductors. If the 3-phase motor is the only load being supplied, the circuit from the supervised disconnecting means to the fire pump controller and then on the fire pump motor can be three ungrounded conductors and an equipment grounding conductor. The equipment grounding conductor is sized from Table 250.122, based on the rating or setting of the overcurrent protective device. The equipment grounding conductor is not required to be larger than the ungrounded circuit conductors per 250.122 (A).	250.24(C), 250.122(A).
U. EMERGENCY SYSTEMS		
185.	Provide (a) properly sized emergency power source(s) for required emergency load(s).	700.5
186.	A completely independent raceway and wiring system shall be installed for emergency circuits.	700.9
187.	Although the alternate power source is permitted to supply emergency loads as well as other loads, the transfer switch used for the emergency system is strictly limited to emergency loads, that is, loads classified as emergency in accordance with 700.1. Other loads, such as legally required standby loads or optional standby loads (covered by Articles 701 and 702) are not permitted to be supplied from the emergency system transfer switch. Where a single generator is used to supply both emergency and nonemergency loads, multiple transfer switches are required.	701 & 702
188.	Show location of emergency power inverter; required to be physically separated from normal source power or enclosed in 1-hour rated enclosure.	700.12
189.	Provide selective overcurrent protection.	700.27
190.	The branch circuit feeding the unit equipment (emergency light with self-contained rechargeable battery) shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches or time clocks. Indicate the correct circuit wiring diagram on the plans.	700.12(E)
191.	Provide Coordination study for all emergency and legally required standby systems overcurrent protective devices.	700.27, 701.18
192.	Emergency generator where located within building shall be installed either in spaces fully protected by approved automatic fire suppression systems (sprinklers, carbon dioxide systems, and so forth) or in spaces with a 1-hour fire rating.	700.12
193.	Emergency lighting systems shall be designed and installed so that the failure of any individual lighting element, such as the burning out of a light bulb, cannot leave in total darkness any space that requires emergency illumination.	700.16
194.	Describe the usage of the generator and classify the generator under which Article of the CEC, i.e. 700, 701 or 702.	700, 701,702

	Code Requirements	Code Section
195.	Per Sections 700.8(B), 701.9(B) and 702.8(B) require that where the grounded circuit conductor connected to the emergency source is connected to a grounding electrode conductor at a location remote from the emergency source, a sign must be placed at the grounding location that shall identify all emergency and normal sources connected at that location.	700.8(B), 701.9(B) and 702.8(B)
196.	Marking shall be provided by the manufacturer to indicate whether or not the generator neutral is bonded to the generator frame. Where the bonding of a generator is modified in the field, additional marking shall be required to indicate whether the generator neutral is bonded to the generator frame.	445.11
197.	A listed SPD shall be installed in or on all emergency systems switchboards and panelboards.	700.8
198.	The branch circuit serving emergency lighting and power circuits shall not be part of a multi-wire branch circuit.	700.19
199.	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.	700.24
200.	Selective coordination shall be selected by a licensed professional engineer or other qualified persons engaged primarily in the design, installation, or maintenance of electrical systems. The selection shall be documented and made available to those authorized to design, installed, inspect, maintain, and operate the system.	240
201.	Clarify the grounding method used. Include information on size and termination method.	250
202.	Provide detail on high impedance grounding.	250
V. CAR CHARGER (NON-RESIDENTIAL)		
203.	<p>Multiple charging space requirements. When multiple charging spaces are installed, air movement from table 625(52) raceway(s) is/are required to be installed at the time of construction and shall be installed in accordance with the Texas Electrical Code. Construction plans and specifications shall include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • The type and location of the EVSE. • The raceway(s) shall originate at a service panel or a subpanel(s) serving the area, and shall termination in close proximity to the proposed location of the charging equipment and into listed suitable cabinet(s), box(es), enclosure(s) or equivalent. • Plan design shall be based upon 40-ampere minimum branch circuits. • Electrical calculations shall substantiate the design of the electrical system, to include the rating of equipment and any on-site distribution transformers and have sufficient capacity to simultaneously charge all required EVs at its full rated amperage. • The service panel or subpanel(s) shall have sufficient capacity to accommodate the required number of dedicated branch circuit(s) for the future installation of the EVSE. • EV charging space calculation (5.106.5.3.3). LB BU-050 shall be used to determine if single or multiple charging space requirements apply for the future installation EVSE. <p>Identification. The service panel or subpanel(s) circuit directory shall identify the reserved overcurrent protective space(s) for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".</p>	625 IECC
W. MEANS OF EGRESS		
204.	Means of egress illumination	IBC 1008, 1013
205.	Exit signs	IBC 1008
		IBC 1013

	Code Requirements	Code Section
206.	X. EMERGENCY SYSTEMS	Article 700 IBC 2702
207.	Power source	700.12
208.	Independent wiring	700.10(B)
209.	Storage battery	700.12(A)
210.	Generator set	700.12(B)
211.	Separate service	700.12(D)
212.	Unit equipment	700.12(F)
213.	Signs	700.7, 701.7
214.	Loads on emergency branch circuits	700.15
215.	Capacity	700.4
216.	Generator control wiring	700.10(D)(3)
	Y. STANDBY SYSTEMS	Article 701 IBC 2702
217.	Capacity and rating	701.4
218.	Power source	701.12
219.	Storage battery	701.12(A)
220.	Generator set	701.12(B)
221.	Uninterruptable power supply	701.12(C)
222.	Separate service	701.12(D)
223.	Connected ahead of service disconnect	701.12(E)
224.	Unit equipment	701.12(G)