

ELECTRICAL SPECIFICATIONS
DIVISION 16 - ELECTRICAL SPECIFICATIONS

PART I. GENERAL PROVISIONS

1. SCOPE: PROVIDE ALL LABOR, MATERIAL, AND EQUIPMENT IN ACCORDANCE WITH THESE SPECIFICATIONS, AND THE ACCOMPANYING DRAWINGS TO PROVIDE A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM FOR THE BUILDING.
- A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL OF THE FOLLOWING MATERIAL AND EQUIPMENT UNDER THIS DIVISION OF THE SPECIFICATIONS, UNLESS NOTED OTHERWISE: LIGHTING FIXTURES; LAMPS; 600 VOLT WIRE AND CABLE; WIRING DEVICES; DEVICE PLATES; DEVICE, PULL, AND JUNCTION BOXES; LIGHTING CONTROLS; CIRCUIT BREAKERS; AND WIRE AND CABLE TERMINATIONS.
- B. THE FOLLOWING MATERIAL AND EQUIPMENT WILL BE FURNISHED AND/OR INSTALLED BY OTHERS, OR UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, UNLESS NOTED OTHERWISE: LOW VOLTAGE (24 VOLT) WIRE AND CABLE, COMMUNICATION DEVICES, SECURITY EQUIPMENT, POINT OF SALE (POS) EQUIPMENT.
2. GENERAL REQUIREMENTS: ALL WORK SHALL BE PERFORMED BY SKILLED LICENSED ELECTRICIANS IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE, MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, APPLICABLE FEDERAL, STATE AND LOCAL CODES, AND THE REQUIREMENTS OF THE ELECTRICAL UTILITY COMPANY FURNISHING THE SERVICES. ALL NECESSARY CONSTRUCTION PERMITS AND CERTIFICATES OF INSPECTION SHALL BE PURCHASED AND OBTAINED UNDER THIS CONTRACT.
- A. COORDINATION: ALL OUTLETS MUST BE ACCURATELY LOCATED, PARTICULARLY APPLIANCE OUTLETS WHICH SHALL BE LOCATED FROM THE DIMENSIONS GIVEN ON THE DRAWING AND FIELD VERIFIED. REVIEW THE ARCHITECTURAL PLUMBING AND HEATING AND VENTILATING PLANS IN ORDER TO COORDINATE THIS WORK WITH OTHER TRADES, AND COOPERATE WITH THEM IN THE ENTIRE INSTALLATION.
3. SERVICE VOLTAGE: THESE DRAWINGS ARE FOR A METERED, UNDERGROUND BUILDING SERVICE OF 120/208 VOLT, THREE PHASE, FOUR WIRE, 60 HERTZ. THE CONTRACTOR SHALL CONTACT THE ELECTRICAL UTILITY AND VERIFY ALL OF THE ABOVE SERVICE CHARACTERISTICS, AND THE AVAILABLE FAULT CURRENT.

PART II. MATERIALS

1. MATERIALS: ALL MATERIALS SHALL BE NEW AND OF THE QUALITY INDICATED BY THE SPECIFIED BRAND NAMES. SUBSTITUTIONS OF MATERIAL OF EQUAL QUALITY BY OTHER MAJOR MANUFACTURERS OF COMMERCIAL EQUIPMENT MAY BE ACCEPTABLE PROVIDED A LIST OF SUCH SUBSTITUTIONS IS APPROVED IN WRITING BY POPEYES ARCHITECTURE AND ENGINEERING DEPARTMENT. THE CONTRACTOR SHALL SUBMIT A SUBSTITUTION LIST IN TRIPLICATE AT LEAST FIVE DAYS PRIOR TO THE BID OPENING.

- A. LIGHTING FIXTURES: ALL LIGHTING FIXTURES SHALL BE UL LISTED, COMMERCIAL QUALITY.
- B. LAMPS: ALL NEW FIXTURES SHALL CONTAIN LED LAMPS AND SHALL BE AS DESCRIBED IN THE LIGHTING FIXTURE SCHEDULE AND ON THE CONSTRUCTION DOCUMENTS.
- C. WIRING DEVICES: ALL WIRING DEVICES SHALL BE UL LISTED, COMMERCIAL SPECIFICATION GRADE. SWITCHES SHALL BE RATED 20 AMPS AT 120/277 VOLTS, AC. STANDARD RECEPTACLES SHALL BE 20 AMP, DUPLEX, GROUNDING TYPE, IN NEMA CONFIGURATIONS, UNLESS NOTED OTHERWISE. SWITCHES IN THE SAME LOCATION SHALL BE GANGED BEHIND A SINGLE PLATE. DEVICE PLATES IN THE KITCHEN AREA SHALL BE METAL, ALUMINUM OR STAINLESS STEEL. DEVICE PLATES IN THE DINING AREA SHALL BE THERMOPLASTIC PLASTIC (NYLON) OR METAL, COLOR AS APPROVED BY THE ARCHITECT OR OWNER. APPROVED MANUFACTURERS OF SWITCHES AND RECEPTACLES ARE HUBBELL, ARROW HART, BRYANT, LEVITON, PASS & SEYMOUR, GENERAL ELECTRIC, SLATER, OR EQUAL.
1. SWITCHES:
 - a. SINGLE POLE: HUBBELL HBL1221-I, OR EQUAL.
 - b. THREE WAY: HUBBELL HBL1223-I, OR EQUAL.
2. RECEPTACLES:
 - a. NEMA 5-20R: HUBBELL 5362J, OR EQUAL.
 - b. NEMA 5-20R-IG: HUBBELL IG-5362, OR EQUAL.
 - c. NEMA 5-20R-IG/SS: HUBBELL IG-5362-OS, OR EQUAL.
 - d. NEMA 5-20R-GFCI: HUBBELL GF5362-I, OR EQUAL.
 - e. NEMA 5-20R: HUBBELL 5462-I, OR EQUAL.
 - f. OTHERS: COMMERCIAL OR INDUSTRIAL GRADE, UL LISTED, FEDERAL SPECIFICATION WC596F.
3. WP PLATES: WEATHERPROOF COVERS ARE PERMITTED UNDER NEC ARTICLE 406.8(B)(1).
4. CONDUIT AND FITTINGS: CONDUIT PERMITTED: (A) RIGID GALVANIZED STEEL (RGS), (B) EMT, (C) PVC, AND (D) ENT. TYPES UTILIZED SHALL BE RUN ONLY AS PERMITTED PER CODE. ALL WIRING SHALL BE RUN IN CONDUIT. CONDUIT PLACED IN CONCRETE OR RUN UNDERGROUND SHALL BE RIGID GALVANIZED CONDUIT OR PVC. IF PVC IS USED, ALL ELBOWS, SWEEPS AND STUB-UPS SHALL BE RGS. CONDUIT EXPOSED OR RUN IN MASONRY WALLS ABOVE GRADE MAY BE PVC OR EMT WHERE ALLOWED BY LOCAL CODES. IF EMT IS NOT PERMITTED, RIGID SCREWED GALVANIZED PIPE CONDUIT AND FITTINGS SHALL BE USED. IF SHIELDED CABLE IS REQUIRED FOR CONTROL CIRCUITRY, IT SHALL BE TAN, GREY OR ANY NEUTRAL COLOR OTHER THAN THAT AS SPECIFIED FOR POWER DISTRIBUTION. NO CONDUIT SMALLER THAN 3/4" SHALL BE INSTALLED EXCEPT FOR TWO-WIRE SWITCH LEGS. ALL CONDUIT BENDS SHALL BE FREE FROM DENTS AND KINKS. ALL CONDUITS SHALL BE ELECTRICALLY CONTINUOUS FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO ALL METAL BOXES WITH ONE LOCK NUT OUTSIDE, AND ONE INSIDE THE BOX WITH A REINFORCED BAKELITE BUSHING. IF PVC, OR ENT, IS USED, THEN APPROPRIATE SIZED, ELECTRICALLY CONTINUOUS, BOND WIRES SHALL BE RUN FROM THE SERVICE EQUIPMENT TO ALL OUTLETS, AND SHALL BE SECURED TO EACH WIRING DEVICE PER THE NATIONAL ELECTRICAL CODE. WHERE CONNECTIONS ARE TO BE MADE BETWEEN CONDUIT TERMINATIONS AND MOTORS, EQUIPMENT, OR APPARATUS NECESSITATING FLEXIBLE CONNECTIONS, APPROVED FLEXIBLE CONDUIT SHALL BE USED. OUTDOOR CONNECTIONS TO FANS, HVAC UNITS, OR ROTATING EQUIPMENT SHALL BE MADE WITH HELICAL WOUND, LIQUIDTIGHT, FLEXIBLE STEEL CONDUIT. EXPOSED CONDUIT SHALL BE SUITABLY SUPPORTED AT INTERVALS NOT TO EXCEED FIVE (5) FEET. DURING CONSTRUCTION, CONDUIT SHALL BE KEPT FREE OF ALL FOREIGN MATTER BY USE OF CAPPED BUSHINGS ON ALL TURNED UP ENDS. PAPER OR WOOD PLUGS ARE NOT ACCEPTABLE FOR THIS PURPOSE.
5. WIRE AND CABLES: ALL WIRE AND CABLES SHALL BE UNDERWRITERS LABORATORIES LISTED, AND LABELED, AND CONFORM WITH APPLICABLE STANDARDS OF UL (44, AND 64), NEMA (WC-5, AND WC-7), IPCEA (S-61-40, AND S-66-524), FEDERAL SPECIFICATIONS (J-C-30A(1), AND H-1-553), ANSI, AND OTHER APPLICABLE INDUSTRY STANDARDS. CONNECTORS AND LUGS SHALL MEET UL PUBLICATION 486. ALL BRANCH CIRCUIT WIRING SHALL BE 600 VOLT, COPPER, 75 DEGREE C, TYPE THHN/THWN WITH A MINIMUM SIZE OF #12 AWG, UNLESS NOTED OTHERWISE. WIRE SIZES OF #10 AWG AND LARGER SHALL BE STRANDED. SERVICE AND FEEDER CABLES SHALL BE 600 VOLT, STRANDED COPPER, 75 DEGREE C, MIN. TYPE XHHW. ALL CIRCUITS SHALL HAVE A SEPARATE GROUND CONDUCTOR. PROVIDE GREEN-INSULATED GROUND WIRE IN ALL RACEWAYS, CABLE ASSEMBLIES, AND WHERE NOTED. SIZE EQUIPMENT GROUND PER TABLE 250.122 OF THE NATIONAL ELECTRICAL CODE. INSULATION COLOR CODES SHALL BE BLACK, RED, AND BLUE (PHASE), WHITE (NEUTRAL), AND GREEN (GROUND).
- A. ALL WIRING SHALL BE INSTALLED IN CONDUIT, EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. NON-METALLIC SHEATHED (TYPE NM) CABLE IS NOT PERMITTED.

- B. ALL BRANCH CIRCUIT, COMMUNICATION, SIGNALING, AND CONTROL WIRING SHALL BE ROUTED ABOVE THE CEILING. VERIFY WHETHER OR NOT THE SPACE ABOVE THE CEILING IS USED AS A SPACE FOR RETURN AIR FOR THE ENVIRONMENTAL AIR SYSTEM. IF IT IS USED FOR RETURN AIR, PROVIDE APPROVED RACEWAYS FOR ALL OVERHEAD WIRING PER NEC ARTICLE 300.22(B). IF IT IS NOT "OTHER SPACE USED FOR ENVIRONMENTAL AIR", APPROVED LOW VOLTAGE CABLES MEETING THE REQUIREMENTS OF NEC ARTICLES 725 AND 760 MAY BE RUN WITHOUT RACEWAYS, UNO. ALL SAFETY CONTROL WIRING FOR FIRE PROTECTION SYSTEMS, SHUNT TRIPS, ETC. SHALL BE RUN IN A RACEWAY IN ACCORDANCE WITH NEC ARTICLES 725.25 AND 725.28.
6. BOXES AND WIREWAYS: ALL JUNCTION BOXES, PULL BOXES, WIREWAYS, ETC. SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

PART III. EXECUTION

1. TESTS: MAKE ALL TESTS NECESSARY TO ENSURE THAT THE ENTIRE INSTALLATION IS FREE FROM IMPROPER GROUNDS, AND FROM SHORTED AND/OR OPEN CONDUCTORS. VOLTAGE, CURRENT, AND ROTATION TESTS SHALL BE MADE BEFORE ANY MOTORS ARE PLACED IN OPERATION. ALL LOADS SHALL BE BALANCED ACROSS PHASES. CHECK TO SEE THAT ALL LIGHTS WORK, AND ARE CONTROLLED BY SWITCHES INDICATED ON DRAWINGS, OR CIRCUIT BREAKERS SO INDICATED ON PANEL SCHEDULE.
2. GUARANTEE: FURNISH A GUARANTEE IN WRITING TO THE OWNER THAT ALL WORK EXECUTED UNDER THIS SECTION IS FREE FROM DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE. IN ADDITION, DURING THE TERM OF THIS GUARANTEE, THE REPAIR AND/OR REPLACEMENT OF ANY DEFECTIVE WORK, AND ALL RESULTING DAMAGES SHALL BE MADE AT NO ADDITIONAL EXPENSE TO THE OWNER.
3. CLEAN-UP: LEAVE THE ELECTRICAL PORTION OF THE WORK IN A CLEAN AND FINISHED CONDITION.
4. SHOP DRAWINGS: PROVIDE SHOP DRAWINGS FOR THE LIGHTING FIXTURES.
5. AS-BUILT DRAWINGS: MAINTAIN AS-BUILT DRAWINGS, UPDATED DAILY DURING CONSTRUCTION, AND PRESENT THE OWNER WITH ONE SET UPON COMPLETION. PROVIDE THE OWNER'S PERSONNEL WITH ON-SITE INSTRUCTIONS IN THE OPERATION AND MAINTENANCE OF THE COMPLETE ELECTRICAL SYSTEM.

LEGEND

- ELECTRICAL SYMBOLS**
- CONDUIT RUN CONCEALED IN CEILING OR IN WALL.
 - EXISTING CONDUIT AND WIRING TO REMAIN.
 - CIRCUIT HOME RUN. NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS.
 - SINGLE FACE EXIT LIGHT (W/EMERGENCY BATTERY PACK AND TWO (2) EMERGENCY LIGHT HEADS. SEE FIXTURE SCHEDULE.
 - LIGHT FIXTURE. LETTER DENOTES MARK. SEE FIXTURE SCHEDULE.
 - LIGHT FIXTURE ON NIGHT LIGHT ("NL" IN SWITCHED CIRCUIT).
 - LED CAN LIGHT FIXTURE. LETTER DENOTES MARK. SEE FIXTURE SCHEDULE.
 - PENDANT LIGHT FIXTURE. LETTER DENOTES MARK. SEE FIXTURE SCHEDULE.
 - TOGGLE SWITCH - SINGLE POLE - HUBBELL #HBL1221-I.
 - DUPLEX RECEPTACLE. NUMBER SUBSCRIPT INDICATES MOUNTING HEIGHT ASV FINISHED FLOOR IF DIFFERENT THAN SPECIFIED. HUBBELL #5362-I.
 - JUNCTION OR OUTLET BOX.
 - 200/120 PANELBOARD.
 - SEE ELECTRICAL NOTES.
 - A.F.F.** ABOVE FINISHED FLOOR.
 - A.F.C.** ABOVE FINISHED CEILING.
 - F.B.C.** FURNISHED BY CONTRACTOR.
 - G.F.I.** GROUND FAULT INTERRUPTING.
 - W.P.** WEATHERPROOF.
 - U.N.O.** UNLESS NOTED OTHERWISE.

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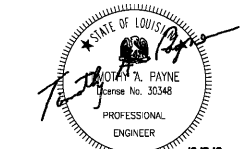
ELECTRICAL DATA SHEET and SPECIFICATIONS

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