

DIVISION 26 - ELECTRICAL

260100 - BASIC ELECTRICAL REQUIREMENTS

1.1 QUALITY ASSURANCE

- A. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AND AGENCIES:
 1. THE NATIONAL ELECTRICAL CODE (NFPA 70), 2020 EDITION WITH GEORGIA AMENDMENTS.
 2. STATE AND LOCAL ORDINANCES GOVERNING ELECTRICAL WORK.
- B. ALL MATERIALS SHALL BE NEW AND SHALL CONFORM TO STANDARDS WHERE SUCH HAVE BEEN ESTABLISHED FOR THE PARTICULAR MATERIAL.

1.2 PERMITS

- A. OBTAIN ALL PERMITS AND INSPECTIONS REQUIRED FOR THE WORK INVOLVED.

1.3 WARRANTY

- A. THE CONTRACTOR SHALL WARRANT TO THE OWNER THAT ALL WORK SHALL BE FREE FROM DEFECTS AND WILL CONFORM TO THE CONTRACT DOCUMENTS. THIS WARRANTY SHALL EXTEND NOT LESS THAN ONE YEAR FROM THE DATE OF BENEFICIAL OCCUPANCY.

1.4 DRAWINGS

- A. COORDINATE INSTALLATION OF EQUIPMENT WITH EXISTING CONDITIONS. DO NOT SCALE DRAWINGS FOR CONNECTION LOCATIONS. BRING ALL DISCREPANCIES TO THE IMMEDIATE ATTENTION OF THE ENGINEER.
- B. CONTRACTOR SHALL INSTALL AND CIRCUIT ALL ELECTRICAL WORK AS INDICATED ON DRAWINGS UNLESS EXISTING CONDITIONS REQUIRES A CHANGE OR REROUTING OF THIS WORK.

1.5 EQUIPMENT REQUIRING ELECTRICAL SERVICE

- A. REVIEW ALL SPECIFICATIONS SECTIONS AND DRAWINGS FOR EQUIPMENT REQUIRING ELECTRICAL SERVICE. PROVIDE SERVICE TO AND MAKE CONNECTIONS TO ALL SUCH EQUIPMENT.

1.6 SCHEDULING OF OUTAGES

- A. ELECTRICAL WORK REQUIRING INTERRUPTION OF ELECTRICAL POWER WHICH WOULD ADVERSELY AFFECT THE NORMAL OPERATION OF OTHER PORTIONS OF THE OWNER'S PROPERTY, SHALL BE DONE AT OTHER THAN NORMAL WORKING HOURS. SCHEDULE THE INTERRUPTION OF ELECTRICAL POWER THREE WORKING DAYS PRIOR TO ACTUAL SHUTDOWN.

1.7 SITE INVESTIGATION AND RENOVATION CONDITIONS

- A. PRIOR TO SUBMITTING BIDS FOR THE PROJECT, VISIT THE SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS. THE PROJECT SHALL BE RESTORED TO ITS EXISTING CONDITIONS, WITH THE EXCEPTION OF WORK UNDER THIS CONTRACT, PRIOR TO FINAL PAYMENT.
- B. PROVIDE ADDITIONS AND ALTERATIONS TO EXISTING WORK REQUIRED TO PRODUCE A COMPLETE ELECTRICAL INSTALLATION. CUTTING, CHANNELING, CHASING, OR DRILLING OF WALLS, OR OTHER SURFACES AND SUPPORT, OR ANCHORAGE OF CONDUIT, OR OTHER ELECTRICAL WORK, SHALL BE DONE WITHOUT DAMAGE TO OTHER EQUIPMENT. EXISTING SURFACES SHALL THEN BE PATCHED AND PAINTED TO MATCH THE SURROUNDING AREAS.

1.8 CLEANING AND PAINTING

- A. REMOVE OIL, DIRT, GREASE AND FOREIGN MATERIALS FROM ALL EQUIPMENT. TOUCH UP SCRATCH OR MARRED SURFACES OF PANELBOARDS AND CABINET TRIMS, AND EQUIPMENT ENCLOSURES WITH PAINT MANUFACTURED SPECIFICALLY FOR THAT PURPOSE.

261000 - BASIC MATERIALS

2.1 RACEWAYS

- A. RACEWAY IS REQUIRED FOR ALL WIRING, UNLESS SPECIFICALLY INDICATED OR SPECIFIED OTHERWISE. THE MINIMUM SIZE OF CONDUIT SHALL BE 1/2", BUT SHALL NOT BE LESS THAN SIZE INDICATED ON THE DRAWINGS OR REQUIRED BY THE NEC.
- B. CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT) EXCEPT FOR THE FOLLOWING CONDITIONS:
 1. EXTERIOR CONDUITS SHALL BE GALVANIZED RIGID STEEL (GRS) OR INTERMEDIATE METAL CONDUIT (IMC).
 2. CONDUITS INSTALLED IN DIRECT CONTACT WITH EARTH SHALL BE SCHEDULE 40, HEAVY WALL PVC, WHERE TRANSITION IS MADE FROM BELOW EARTH TO ANY TYPE OF RACEWAY OUT OF EARTH, MAKE TRANSITION WITH A RIGID GALVANIZED OR IMC FULLY TAPED.
- C. EMT CONDUIT COUPLINGS AND CONNECTORS SHALL BE STEEL RAINTIGHT TYPE, COMPRESSION TYPE. ALL EMT CONNECTORS SHALL BE INSULATED THROAT TYPE. GRS AND IMC FITTINGS SHALL BE STRANARD THREADED COUPLINGS, LOCKNUTS, BUSHINGS, AND ELBOWS. ALL GRS AND IMC FITTINGS SHALL BE STEEL OR MALLEABLE IRON; SET SCREW OR NON THREADED FITTINGS ARE NOT PERMITTED. NON-METALLIC CONDUIT FITTINGS SHALL BE OF THE SAME MATERIALS AS THE CONDUIT FURNISHED AND SHALL BE THE PRODUCT OF THE SAME MANUFACTURER.
- D. ALL CONDUIT SUPPORT PARTS AND HARDWARE SHALL BE HOT DIPPED GALVANIZED. CONDUIT STRAPS SHALL BE TWO HOLE GALVANIZED OR STAINLESS STEEL METAL TYPE. WIRE OR CHAIN IS NOT ACCEPTABLE FOR CONDUIT HANGERS.
- E. FASTEN CONDUIT SUPPORT DEVICES TO STRUCTURE WITH WOOD SCREWS ON WOOD, TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION ANCHORS ON SOLID MASONRY OR CONCRETE, AND MACHINE BOLTS OR CLAMPS ON STEEL. NAILS ARE NOT ACCEPTABLE. SEAL ALL CONDUITS PENETRATING BUILDING EXTERIOR WITH INSULATING ELECTRICAL PUTTY TO PREVENT ENTRANCE OF MOISTURE.
- F. CONDUIT SHALL BE RUN PARALLEL OR AT RIGHT ANGLES. SUPPORT BRANCH CIRCUIT CONDUITS AT INTERVALS NOT EXCEEDING 10 FEET, AND WITHIN 3 FEET OF EACH BOX OR CHANGE OF DIRECTION.

2.2 WIRES AND CABLES

- A. CONDUCTOR SIZE SHALL BE MINIMUM OF NO. 12 AWG, UNLESS LARGER SIZE IS REQUIRED BY THE DRAWINGS OR THE NEC. ALL WIRE AND CABLE SHALL BEAR THE UL LABEL.
- B. CONDUCTORS NO. 10 AND SMALLER SHALL BE SOLID COPPER, 75°C, TYPE THW OR THWN/THHN. CONDUCTORS LARGER THAN NO. 10 SHALL BE STRANDED COPPER, 75°C, TYPE THW, THWN/THHN, OR XHHW.
- C. COLOR CODE ALL CONDUCTORS. NO 10 AND SMALLER SHALL HAVE SOLID COLOR COMPOUND OR COATING. NO. 8 AND LARGER SHALL HAVE SOLID COLOR COMPOUND OR COLORED PHASE TAPE; TAPE SHALL BE INSTALLED ON CONDUCTORS IN EVERY BOX, TERMINATION POINT, CABINET, OR ENCLOSURE. CODING SHALL BE AS FOLLOWS:
 1. 480Y/277 VOLT THREE PHASE, FOUR WIRE WYE SYSTEM: PHASE A-BROWN, PHASE B-ORANGE, PHASE C-YELLOW, NEUTRAL-GRAY.
 2. GROUNDING CONDUCTORS SHALL BE GREEN.
 3. NEUTRAL CONDUCTORS NO. 6 AND SMALLER SHALL HAVE SOLID INSULATION OR CONTINUOUS COLOR TAPE FOR THE ENTIRE LENGTH OF CONDUCTOR. NEUTRAL CONDUCTORS NO. 4 AND LARGER SHALL HAVE COLORED PHASE TAPE. COLORED TAPE SHALL BE INSTALLED ON CONDUCTORS IN EVERY BOX, AT EACH TERMINATION POINT, CABINET OR OTHER ACCESSIBLE LOCATION.

- D. GROUP AND LACE WITH NYLON TIE STRAPS ALL CONDUCTORS WITHIN ENCLOSURES. MAKE SPLICES IN CONDUCTORS ONLY WITHIN JUNCTION BOXES, WIRING TROUGHS, OR OTHER NEC APPROVED ENCLOSURES. DO NOT SPLICE CONDUCTORS IN PANELBOARDS, SAFETY SWITCHES, PULL BOXES OR MOTOR CONTROL ENCLOSURES. IDENTIFY EACH CONDUCTOR AS TO CIRCUIT CONNECTION IN ALL BOXES AND ENCLOSURES.
- E. TERMINATE STRANDED CONDUCTORS NO. 10 AWG AND SMALLER WITH CRIMP-TYPE LUG OR STUD. CRIMP TERMINAL SHALL BE THE CONFIGURATION TYPE SUITABLE FOR TERMINAL POINT.

2.3 BOXES

- A. DIMENSIONS OF PULL AND JUNCTION BOXES SHALL NOT BE LESS THAN THOSE REQUIRED BY THE NEC FOR THE NUMBER, SIZE, AND POSITION OF CONDUCTORS ENTERING THE BOX.
- B. ALL BOXES SHALL BE COMPLETELY ACCESSIBLE AND AS REQUIRED BY THE NEC.

2.4 ELECTRICAL CONNECTIONS FOR EQUIPMENT

- A. FOR EACH ELECTRICAL CONNECTION PROVIDE COMPLETE ASSEMBLY OF MATERIALS AND TO COMPLETE SPLICES AND TERMINATIONS.
- B. PROVIDE FITTINGS OF TYPES, GRADES, SIZES REQUIRED FOR EACH TYPE SERVICE.
- C. PROVIDE ELECTRICAL CONNECTORS AND TERMINALS WHICH ARE RECOMMENDED BY EQUIPMENT MANUFACTURER FOR INTENDED APPLICATIONS.
- D. PROVIDE ELECTRICAL INSULATING TAPE, HEAT-SHRINKABLE INSULATING TUBING AND BOOTS, WIRENUTS AND CABLE TIES AS RECOMMENDED FOR USE BY ACCESSORIES MANUFACTURERS.
- E. INSTALL ELECTRICAL CONNECTIONS IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS AND RECOGNIZED INDUSTRY PRACTICES.
- F. MATCH CONDUCTORS OF ELECTRICAL CONNECTIONS FOR PROPER INTERFACE BETWEEN ELECTRICAL POWER SUPPLIES AND INSTALLED EQUIPMENT.
- G. COVER SPLICES WITH ELECTRICAL INSULATING MATERIAL.
- H. PREPARE CABLES AND WIRES BY CUTTING AND STRIPPING COVERING.

- I. TIGHTEN CONNECTORS AND TERMINALS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH EQUIPMENT MANUFACTURERS PUBLISHED TORQUE TIGHTENING VALUES FOR EQUIPMENT CONNECTORS.

2.5 CIRCUIT DISCONNECTS

- A. PRODUCTS OF GENERAL ELECTIC, CUTLER-HAMMER, SQUARE D, OR SIEMENS WHICH COMPLY WITH THESE SPECIFICATIONS ARE ACCEPTABLE.
- B. DISCONNECT SWITCHES SHALL BE HEAVY DUTY NONFUSIBLE SAFETY SWITCH TYPE, UNLESS FUSED TYPE IS INDICATED ON THE DRAWINGS, WITH THE NUMBER OF POLES REQUIRED TO DISCONNECT ALL UNGROUNDED CONDUCTORS SERVING THE EQUIPMENT.
 1. FURNISH AN EQUIPMENT GROUNDING CONDUCTOR LUG BONDED TO THE SWITCH ENCLOSURE.
 2. FURNISH NEMA TYPE ONE ENCLOSURE FOR ALL INTERIOR DRY LOCATIONS, AND NEMA TYPE 3R FOR DAMP, WET, OR EXTERIOR LOCATIONS UNLESS OTHER TYPES ARE INDICATED ON THE DRAWINGS.
- C. SWITCHES SHALL HAVE THE FOLLOWING FEATURES:
 1. PERMANENT NAME PLATE INDICATING ALL RATINGS.
 2. 600 VOLT RATING FOR 250 TO 600 VOLT SYSTEMS, 250 VOLT RATING FOR SYSTEMS BELOW 250 VOLTS.
 3. REJECTION CLIPS TO ACCEPT ONLY RK1 OR RK5 FUSES WHEN SWITCH IS FUSIBLE TYPE.
- D. LOCATE SWITCHES TO PROVIDE FULL ACCESSIBILITY AND WORKING CLEARANCES REQUIRED BY THE NEC. LOCATE ADJACENT TO EQUIPMENT SERVED UNLESS DRAWINGS INDICATE OTHERWISE. MOUNT SWITCH DIRECTLY TO STRUCTURE OR TO METAL CHANNEL DEPENDING UPON FIELD CONDITIONS. MOUNT SWITCH HANDLE BETWEEN 36" AND 60" ABOVE FINISHED FLOOR.

2.6 SUPPORTING DEVICES

- A. PROVIDE AND INSTALL SUPPORTING DEVICES WHICH COMPLY WITH MANUFACTURER'S STANDARD MATERIALS, DESIGN, AND CONSTRUCTION IN ACCORDANCE WITH PUBLISHED STANDARDS AND AS REQUIRED FOR COMPLETE INSTALLATION.
- B. COORDINATE WITH OTHER ELECTRICAL WORK, INCLUDING RACEWAY AND WIRING WORK, AS NECESSARY TO INTERFACE INSTALLATION OF SUPPORTING DEVICES.

2.7 ELECTRICAL IDENTIFICATION

- A. INSTALL ENGRAVED PLASTIC LAMINATE SIGN ON EACH MAJOR UNIT OF ELECTRICAL EQUIPMENT, PROVIDE A SINGLE LINE OF TEXT, 1/2" HIGH LETTERING ON 1 1/2" HIGH SIGN (OR 2" HIGH SIGN IF 2 LINES REQUIRED). PROVIDE SIGNS FOR EACH UNIT OF THE FOLLOWING:
 1. ELECTRICAL CABINETS AND ENCLOSURES.
 2. DISCONNECT SWITCHES.
 3. PANELBOARDS.

264000 - DISTRIBUTION EQUIPMENT

3.1 GROUNDING SYSTEMS

- A. EQUIPMENT GROUNDING SYSTEM SHALL BE ESTABLISHED WITH EQUIPMENT GROUND CONDUCTORS. THE USE OF METALLIC RACEWAYS FOR EQUIPMENT GROUNDING IS NOT ACCEPTABLE, UNLESS INDICATED OTHERWISE, PROVIDE EQUIPMENT GROUND THE SAME SIZE AS PHASE CONDUCTORS.
- B. GROUNDING ELECTRODE CONDUCTORS SHALL BE BARE OR GREEN INSULATED COPPER SIZED AS INDICATED ON THE DRAWINGS. EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN INSULATED TYPE THW, THWN, OR XHHW SIZED AS INDICATED ON THE DRAWINGS, WHERE SIZES ARE NOT INDICATED, GROUNDING CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH NEC ARTICLE 250.
- C. GROUND ALL NONCURRENT CARRYING PARTS OF THE ELECTRICAL SYSTEM, I.E., WIREWAYS, EQUIPMENT ENCLOSURES AND FRAMES, JUNCTION AND OUTLET BOXES, MACHINE FRAMES, AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY WITH ELECTRICAL CIRCUITS.
- D. GROUNDING CONDUCTORS FOR BRANCH CIRCUITS ARE NOT SHOWN ON THE DRAWINGS; HOWEVER, GROUNDING CONDUCTORS SHALL BE PROVIDED IN ALL BRANCH CIRCUIT RACEWAYS AND FLEXIBLE CONDUIT. GROUNDING CONDUCTORS SHALL BE THE SAME AWG SIZE AS BRANCH CIRCUIT CONDUCTORS.

3.2 PANELBOARDS

- A. PRODUCTS OF SQUARE D, GENERAL ELECTRIC, CUTLAR HAMMER OR SIEMENS WHICH COMPLY WITH THESE SPECIFICATIONS SHALL ONLY BE ACCEPTABLE.
- B. ALL PANELS AND CIRCUIT BREAKERS SHALL BE UL LISTED AND BEAR A UL LABEL.
- C. ALL BUS BARS SHALL BE COPPER. EACH PANEL SHALL CONTAIN A FULL SIZE GROUNDING BUS AND, WHEN REQUIRED, A FULL SIZE INSULATED NEUTRAL BUS.
- D. BRANCH CIRCUIT PANEL BOARD WIDTH SHALL BE BETWEEN 20 AND 22 INCHES; DEPTH SHALL BE 5 3/4" MAXIMUM.

- E. CIRCUIT BREAKERS SHALL BE QUICK-MAKE, QUICK-BREAK, THERMAL MAGNETIC TYPE BOLTED TO THE BUS. MULTI-POLE BREAKERS SHALL BE COMMON TRIP AND COMMON RESET TYPE; TIE HANDLE CONNECTIONS ARE NOT ACCEPTABLE. INTERRUPTING RATINGS ON 208 VOLT SYSTEMS SHALL BE 10,000 RMS SYMMETRICAL AMPS MINIMUM, AND 480 VOLT SYSTEMS 14,000 RMS SYMMETRICAL AMPS MINIMUM.

- F. MOUNT PANEL BOARDS WITH TOP CIRCUIT NOT MORE THAN 6'-6" ABOVE FINISHED FLOOR.

- G. PROVIDE IN EACH PANEL BOARD A TYPE WRITTEN CIRCUIT DIRECTORY MOUNTED UNDER CLEAR PLASTIC IN METAL HOLDER IN THE DOOR OF THE PANEL REFLECTING ALL FIELD CHANGES ADDITIONS.

- H. INSTALL PUSH-IN KNOCK-OUT CLOSURE PLUGS IN ANY UNUSED KNOCK-OUT OPENINGS.

- I. PANELBOARDS SHALL BE DOOR IN DOOR TYPE CONSTRUCTION.

3.3 FUSES

- A. PROVIDE FUSES OF TYPES, SIZES AND RATINGS RECOMMENDED BY EQUIPMENT MANUFACTURER.

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Revisions

No.	Date	Description	By

EFFINGHAM COUNTY
 REC COMPLEX LIGHTING
 SPRINGFIELD
 GEORGIA

Stamp

Sheet Title
ELECTRICAL SPECIFICATIONS

Job No.	21003.00
Drawn	L.C.
Checked	W.P.
Date	2/28/2021
Sheet No.	E2

CADD PLOT
 19-FEB-2021
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 lcauley