ELECTRICAL SPECIFICATION:

INTRODUCTION:

A. THE WORK, APPARATUS AND MATERIALS WHICH SHALL BE FURNISHED UNDER THESE SPECIFICATIONS AND ACCOMPANYING DRAWINGS SHALL INCLUDE ALL ITEMS SPECIFIED HEREINAFTER AND SHOWN ON THE DRAWINGS. ALL OTHER MATERIALS NECESSARY FOR THE COMPLETE INSTALLATION SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR TO PROVIDE COMPLETE ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN.

B. THE CONTRACTOR SHALL EXTEND THE SERVICE FROM THE POINT OF SERVICE ATTACHMENT FURNISHING ALL PROTECTIVE DEVICES, CONDUCTORS, SUPPORTS, RACEWAYS, ETC. TO PROVIDE COMPLETE INTERIOR ELECTRICAL SYSTEMS TO SERVE MOTOR LOADS, LIGHTING LOADS AND MISCELLANEOUS ELECTRICAL LOADS, AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREINAFTER. THE WORK SHALL INCLUDE COMPLETE TESTING OF ALL EQUIPMENT AND WIRING AT THE COMPLETION OF THE WORK AND MAKING ANY MINOR CONNECTION CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT. ALL WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY AND NO SUBSTANDARD WORK WILL BE ACCEPTED.

C. VERIFY CONDITIONS AT THE FIELD PRIOR TO PRICING THE JOB. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL DETAILS OF THE WORK AND EXISTING CONDITIONS.

D. CONTRACTOR SHALL COORDINATE THE EXACT MOUNTING HEIGHTS AND/OR LOCATIONS OF ALL LIGHTING FIXTURE SWITCHES, OUTLETS AND WIRING DEVICES AND SHALL PERFORM ALL WORK NOTED ON PLANS, IN NOTES OR IN DETAILS RELATED TO THE INSTALLATION. THE OWNER RESERVES THE RIGHT TO RELOCATE ANY DEVICE PRIOR TO ROUGH-IN 10' WITHOUT REVISION TO THE CONTRACT.

E. CONTRACTOR SHALL PAY FOR ALL PERMITS, FEE INSPECTIONS AND TESTING.

F. ALL REQUIRED INSURANCE TO BE PROVIDED FOR PROTECTION AGAINST PUBLIC LIABILITY OF PROPERTY DAMAGE FOR DURATION OF THE WORK.

G. ELECTRICAL INSTALLATION TO MEET ALL STANDARD REQUIREMENTS OF THE LOCAL POWER AND TELEPHONE COMPANIES. ELECTRICAL CONTRACTOR SHALL CONTACT LOCAL POWER AND TELEPHONE COMPANY PRIOR TO BID AND START OF CONSTRUCTION.

ELECTRICAL CODES

A. THE WORK UNDER THE REQUIREMENTS OF THESE SPECIFICATIONS SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. THE INSTALLATION SHALL ALSO COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS OF LOCAL AND STATE LAWS AND ORDINANCES.

INTERFERENCES

A. THE PLANS ARE GENERALLY DIAGRAMMATIC AND THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE DIFFERENT TRADES SO THAT INTERFERENCES BETWEEN CONDUITS. PIPING, EQUIPMENT, ARCHITECTURAL AND STRUCTURAL WORK WILL BE AVOIDED. ALL NECESSARY OFFSETS IN RACEWAYS, FITTINGS, ETC. REQUIRED TO PROPERLY INSTALL THE WORK SHALL BE FURNISHED SO AS TO TAKE UP MINIMUM SPACE, AND ALL MATERIALS REQUIRED TO ACCOMPLISH THIS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER. IN CASE INTERFERENCE DEVELOPS, THE OWNER'S AUTHORIZED REPRESENTATIVE WILL DECIDE WHICH EQUIPMENT. PIPING, ETC., MUST BE RELOCATED, REGARDLESS OF WHICH WAS INSTALLED FIRST.

MATERIALS

A. IN GENERAL, MATERIALS AND APPARATUS SHALL COMPLY WITH ALL APPLICABLE TESTS, RATINGS, SPECIFICATIONS, AND REQUIREMENTS OF THE IEEE AND NEMA AND SHALL BEAR THE APPROVED DEVICE LABEL OF THE UNDERWRITERS' LABORATORIES, INC. OR OTHER TESTING LABORATORY APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

B. THE CONTRACTOR SHALL SUBMIT A LIST OF PRINCIPAL MATERIAL ITEMS, GIVING MANUFACTURER'S NAMES AND CATALOG NUMBERS. APPROVAL OF THE LIST SHALL BE OBTAINED FROM THE OWNER BEFORE ORDERS ARE PLACED.

GUARANTEE

A. CONTRACTOR SHALL GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION. CONTRACTOR SHALL RECTIFY ANY DEFECTS DUE TO FAULTY MATERIALS OR WORKMANSHIP AND PAY FOR ANY DAMAGE TO OTHER WORK RESULTING THEREFROM WITHIN SAID PERIOD. THE OWNER WILL GIVE NOTICE OF DEFECTS WITH REASONABLE PROMPTNESS.

IDENTIFICATION OF EQUIPMENT

A. IDENTIFICATION OF EQUIPMENT SHALL BE PROVIDED FOR ALL ELECTRICAL EQUIPMENT INSTALLED BY THE CONTRACTOR. ENGRAVED LAMINATED PLASTIC NAMEPLATES SHALL BE PROVIDED AND IDENTIFICATION SHALL CLEARLY DESCRIBE THE EQUIPMENT AND FUNCTION. COORDINATE NAMES ABBREVIATIONS AND OTHER DESIGNATIONS USED IN ELECTRICAL IDENTIFICATION WORK WITH CORRESPONDING DESIGNATIONS SHOWN, SPECIFIED OR SCHEDULED. PROVIDE NUMBERS, LETTERS AND WORDING AS INDICATED OR IF NOT OTHERWISE INDICATED, AS RECOMMENDED BY MANUFACTURER OR AS REQUIRED FOR PROPER IDENTIFICATION AND MAINTENANCE OF ELECTRICAL SYSTEMS AND EQUIPMENT.

B. INSTALL LABEL TAGS ON ALL WIRE AND CABLE IN JUNCTION BOXES, WIREWAYS AND WIRING GUTTERS OF PANELS. TAGS SHALL IDENTIFY WIRE OR CABLE CIRCUIT NUMBER AND/OR EQUIPMENT SERVED AS SHOWN ON DRAWINGS.

C. ALL JUNCTION BOXES TO BE DESIGNATED WITH PERMANENT MARKER INDICATING PANELBOARD AND CIRCUIT NUMBERS OF BRANCH CIRCUIT WIRING CONTAINED WITHIN.

D. PANELBOARD DIRECTORIES SHALL BE UPDATED/TYPEWRITTEN WITH ACCURATE AND CURRENT INFORMATION BY THE CONTRACTOR AT THE END OF CONSTRUCTION. DIRECTORIES SHALL REFLECT EXISTING UNCHANGED AND NEW RECORD CONDITIONS AND INCLUDE CIRCUIT NUMBER, TENANT NAME, TYPE AND LOCATION OF LOAD.

RACEWAYS AND FITTINGS

A. HOMERUNS SHALL BE A MINIMUM SIZE OF HALF-INCH (1/2"), UNLESS OTHERWISE SPECIFIED. PROVIDE A MINIMUM OF HALF-INCH (1/2") FOR FLEXIBLE CONNECTIONS TO EQUIPMENT.

B. UNDERGROUND INSTALLATIONS:
1. USE THICKWALL NONMETALLIC CONDUIT, SCHEDULE 40 PVC.
2. IN OR UNDER SLAB-ON-GRADE: USE SCHEDULE 40 PVC OR GRAY HDPE PIPE, PER NEC REQUIREMENTS. USE ONLY UL LISTED AND APPROVED FITTINGS FOR COUPLING AND CHANGE-OVER TO DIFFERENT TYPE RACEWAYS.
3. MINIMUM SIZE: 3/4".
4. INSTALL RIGID STEEL, LONG RADIUS ELBOWS FOR CONDUITS LARGER THAN ONE INCH (1").
5. UNDER SLAB CONDUIT OR POURED-IN CONCRETE CONDUIT SHALL BE PAINTED WITH A COAT OF BITUMASTIC. THE BITUMASTIC SHALL BE CONTINUOUS AND CONTINUE UP THROUGH PENETRATION OF CONCRETE SLABS, UP TO 12" A.F.G. CORROSION TAPE IS ACCEPTABLE.

C. OUTDOOR LOCATIONS, ABOVE GRADE: USE RIGID AND LIQUIDTIGHT FLEXIBLE METAL CONDUIT WITH ENHANCED CORROSION. PROVIDE COMPLETELY COATED OF THE RIGID CONDUIT WITH An ALKALI AND RUST RESISTANT BITUMASTIC PAINT, KOPPER # 50.

D. WET AND DAMP LOCATIONS: USE RIGID STEEL, INTERMEDIATE, AND LIQUIDTIGHT FLEXIBLE METAL CONDUIT.

E. DRY LOCATIONS:
1. CONCEALED: ELECTRICAL METALLIC TUBING.
2. EXPOSED:
A)EXTERIOR-RIGID STEEL ONLY.
B)INTERIOR-RIGID STEEL TO 2'0" A.F.G., THENELECTRICAL METALLIC TUBING.

F. METAL CONDUIT
1. RIGID STEEL AND INTERMEDIATE METAL CONDUIT: ANSI C80.1.
2. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1; ALL STEEL FITTINGS.
3. RIGID STEEL CONDUIT SHALL BE UNDERWRITERS' APPROVED HOT-DIP GALVANIZED WITH ENHANCED CORROSION PROTECTION. ZINC METALIZED OR SHERADIZED. THE THREADED ENDS OF THE CONDUIT SHALL BE ZINC COATED AND SHALL BE THREADED TYPE WITH ENHANCED CORROSION PROTECTION.
4. ALL CONDUIT SHALL BE MADE UP TIGHT AND NO RUNNING THREADS WILL BE PERMITTED, "ERICSON" COUPLINGS BEING USED WHERE NECESSARY.

G. FLEXIBLE METAL CONDUIT
1. DESCRIPTION: FOR EXPOSED LOCATIONS, INTERLOCKED STEEL CONSTRUCTION. FOR CONCEALED LOCATIONS- INTERLOCKED STEEL CONSTRUCTION.
2. FITTINGS: ANSI/NEMA FB 1.
3. FLEXIBLE METALLIC CONDUIT IN DRY LOCATIONS SHALL BE UNDERWRITERS' APPROVED, ZINC COATED, SINGLE STRIP TYPE. FITTINGS SHALL BE AS MANUFACTURED BY THOMAS AND BETTS "TITE-BITE", STRAIGHT OR ANGLE CONNECTORS OR APPROVED EQUAL.

H. LIQUIDTIGHT FLEXIBLE METAL CONDUIT
1. DESCRIPTION: INTERLOCKED STEEL CONSTRUCTION WITH PVC JACKET.
2. FITTINGS: ANSI/NEMA FB 1.
3. FLEXIBLE CONDUIT IN DAMP OR WET LOCATIONS SHALL BE UNDERWRITERS' APPROVED FLEXIBLE, LIQUID-TIGHT METAL CONDUIT. FITTINGS SHALL BE AS MANUFACTURED BY APPLETON, CROUSE-HINDS OR THOMAS AND BETTS.

I. ELECTRICAL METALLIC TUBING (EMT)
1. DESCRIPTION: ANSI C80.3; GALVANIZED TUBING.
2. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1; STEEL SET SCREW OR STEEL COMPRESSION COUPLING OR CONNECTORS. ALL CONNECTORS SHALL BE INSULATED THROAT, UP TO ONE INCH.
3. THIN WALL CONDUIT SHALL BE UNDERWRITERS' APPROVED GALVANIZED ELECTRICAL METALLIC TUBING. COUPLINGS AND CONNECTORS FOR CONDUIT SHALL BE STEEL HEX-NUT, ZINC OR CADMIUM PLATED SET SCREW TYPE FITTING

J. NONMETALLIC CONDUIT
1. DESCRIPTION: NEMA TC 2; SCHEDULE 40 PVC.
2. FITTINGS AND CONDUIT BODIES: NEMA TC 3.

K. TYPE MC CABLE
1. MC CABLE MAY BE USED WHERE CONCEALED IN WALLS. SECURE IN NO MORE THAN 3' INTERVALS AND WITHIN 6" OF OUTLET.

L. UNDERGROUND SERVICE CONDUITS/RACEWAY ENTERING THE BUILDING OR STRUCTURE FROM OUTSIDE SHALL BE SEALED, INCLUDING SPARE CONDUITS. SEALANT SHALL BE SUITABLE FOR THIS USE.

M. ALL UNDERGROUND PVC CONDUIT RUNS SHALL HAVE RIGID STEEL ELBOWS AND RIGID SECTIONS AT SLAB PENETRATIONS WHERE SUBJECT TO POSSIBLE DAMAGE.

N. ALL CONDUITS SHALL BE PROPERLY ALIGNED, GROUPED AND SUPPORTED. EXPOSED CONDUIT SHALL BE INSTALLED AT RIGHT ANGLES TO OR PARALLEL TO THE PRINCIPAL STRUCTURAL MEMBERS. ALL CONDUITS SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING 8 FEET. PROVIDE SUPPORT A MINIMUM OF 18" FROM BENDS AND OUTLET BOXES AND ON INTERVALS NOT TO EXCEED 8'-0". CONDUIT IS NOT TO SPAN ANY SPACE UNSUPPORTED. ALL CONDUITS SHALL BE SUPPORTED FROM STRUCTURE AND NOT FROM CEILING SUPPORT SYSTEM.

O. PROVIDE NYLON PULL CORD AND LEAVE IN PLACE IN EACH EMPTY CONDUIT. LABEL EACH END OF THE PULL CORD WITH LOCATION OF THE OPPOSITE END.

BOXES

A. ALL BOXES SHALL BE RIGIDLY MOUNTED AND SHALL BE EQUIPPED WITH SUITABLE SCREW FASTENED COVERS. OPEN KNOCK-OUTS OR HOLES IN BOXES SHALL BE PLUGGED WITH A SUITABLE BLANKING DEVICE.

B. OUTLET BOXES FOR EXPOSED WALL MOUNTING, AND OUTDOOR INSTALLATIONS SHALL BE CAST WITH THREADED HUB TYPE WITH SUITABLE COVERS. WEATHERPROOF RECEPTACLE COVERS SHALL BE "IN USE" TYPE AND HAVE METAL SPRING HINGE LIDS.

CONDUCTORS

A. UNLESS OTHERWISE INDICATED, ALL BRANCH CIRCUIT CONDUCTORS SHALL BE #12 AWG. BRANCH CIRCUITS RUN OVER 75 FEET IN LENGTH. MEASURING ONE WAY FROM THE FIRST OUTLET OF THE CIRCUIT TO THE PANEL, SHALL BE #10 AWG FOR THE ENTIRE CIRCUIT.

B. SPLICES, TAPS AND ATTACHMENT FITTINGS AND LUGS SHALL BE ELECTRICALLY AND MECHANICALLY SECURE AND SOLDERLESS FOR CONDUCTORS SIZES #8 AWG AND LARGER. THERE SHALL BE PLENTY OF SLACK CABLE IN BOXES, OUTLETS AND CABINETS TO INSURE THAT THERE IS NO BINDING AT THE BUSHINGS. ALL LUGS SHALL BE OF THE CORRECT SIZES FOR THE CONDUCTORS JOINED AND IN NO CASE SHALL STRANDS BE CUT FROM A CONDUCTOR IN ORDER TO FIT THE CONDUCTOR INTO A LUG. TAPING OF JOINTS SHALL BE WITH VINYL PLASTIC ELECTRICAL TAPE TO SECURE INSULATION STRENGTH EQUAL TO THAT OF THE CONDUCTORS JOINED.

C. ALL CONDUCTORS SHALL BE COPPER. CONDUCTOR INSULATION SHALL BE DUAL TYPE THHN/THWN 75° C. (167°F.) FOR DRY, DAMP & WET LOCATIONS. CONDUCTOR INSULATION WITH SINGLE TYPE MARKING THHN 90° C. (194° F.) MAY BE USED FOR DRY LOCATIONS ONLY. ALL CONDUCTORS SHALL BE COLOR CODED AS REQUIRED BY NEC AND FURTHER IDENTIFIED AND CODED AS SPECIFIED HEREINAFTER. COLOR CODING SHALL BE BY MEANS OF COLORED INSULATING MATERIAL, COLORED BRAID OR JACKET OVER THE INSULATION OR BY MEANS OF SUITABLE COLORED, PERMANENT, NON-AGING, INSULATING TAPE APPLIED TO CONDUCTORS AT EACH CABINET OR JUNCTION POINT. THE COLOR CODING SHALL BE ACCOMPLISHED AS THE CONDUCTORS ARE INSTALLED. THE FOLLOWING SYSTEMS OF COLOR CODING SHALL BE STRICTLY ADHERED TO:
1. ISOLATED GROUND LEADS: GREEN AND YELLOW.
2. GROUND LEADS: GREEN
3. GROUNDED NEUTRAL LEADS: WHITE
4. 120/240 VOLT, UNGROUNDED PHASE WIRES: BLACK AND RED.

THE COLOR CODE ASSIGNED TO EACH PHASE WIRE SHALL BE CONSISTENTLY FOLLOWED THROUGHOUT. NOTE: WHERE EXISTING BASE BUILDING COLOR CODING DIFFERS FROM COLOR CODING ASSIGNED HERE-IN. CONTRACTOR SHALL USE EXISTING COLOR CODING AS REQUIRED TO MAINTAIN CONSISTENCY. ADVISE ENGINEER (IN WRITING) OF COLOR CODING TO BE USED.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR AND MAKE ALL REQUIRED CONNECTIONS TO SERVE MECHANICAL EQUIPMENT FURNISHED.

E. ALL CONDUITS AND WIRING PENETRATING RATED FLOORS, CEILINGS AND WALLS SHALL BE SEALED TO MAINTAIN FIRE RATING AND INTEGRITY OF SEPARATION. PENETRATION SHALL BE PER UL ASSEMBLY STANDARDS.

F. WHEN MAIN ELECTRICAL SERVICE CONDUCTOR HAS A WIREWAY, E.C. SHALL TAP OFF ALL SERVICE ENTRANCE FEEDERS (PARALLEL CONDUCTORS) FOR TOTAL AMPACITY & BALANCING.

GROUNDING

A. THE INTERIOR ELECTRICAL SYSTEMS SHALL BE COMPLETELY AND EFFECTIVELY GROUNDED AS REQUIRED BY THE NEC AND AS SPECIFIED HEREINAFTER.

B. ALL METALLIC RACEWAYS SHALL BE MECHANICALLY AND ELECTRICALLY SECURE AT ALL JOINTS AND AT ALL BOXES, CABINETS, FITTINGS, AND EQUIPMENT. METALLIC RACEWAYS SHALL BE CONNECTED TO A DIRECT GROUND AT THE POINT OF ELECTRICAL SERVICE ENTRANCE AND SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT THE ENTIRE SYSTEM.

C. ALL GROUND CONDUCTORS SHALL BE INSULATED COPPER UNLESS OTHERWISE NOTED.

D. ALL RACEWAYS WITH #10 OR 12 AWG PHASE CONDUCTORS FOR RECEPTACLES, LIGHTING FIXTURES AND SIMILAR CIRCUITS (NEW BRANCH CIRCUITS) SHALL BE PROVIDED WITH A PARITY SIZED GREEN EQUIPMENT GROUND CONDUCTOR. GROUND CONDUCTOR SHALL BE INSTALLED IN ENTIRE RACEWAY SYSTEM INCLUDING WALL SWITCHES AND FLEXIBLE CONDUIT TO LIGHT FIXTURES. EQUIPMENT GROUND CONDUCTOR SIZES FOR CIRCUITS WITH PHASE CONDUCTORS LARGER THAN #10 AWG ARE INDICATED ON DRAWINGS. GROUND CONDUCTORS SHALL BE CONNECTED TO GROUND BUS IN PANELBOARDS.

E. TERMINATE FEEDER AND BRANCH CIRCUIT INSULATED EQUIPMENT GROUNDING CONDUCTORS WITH GROUNDING LUG, BUS, OR BUSHING. CONDUCTORS LOOPED UNDER SCREW OR BOLT HEADS WILL NOT BE PERMITTED.

F. INSTALL CLAMP-ON CONNECTORS ON CLEAN METAL CONTACT SURFACES TO ENSURE ELECTRICAL CONDUCTIVITY AND CIRCUIT INTEGRITY.

G. PROVIDE GROUNDING BUSHING AND A CONTINUOUS COPPER BONDING JUMPER FROM THE BUSHING TO THE EQUIPMENT GROUND BUS IN ALL FEEDERS. THE BONDING JUMPER SHALL BE THE SAME SIZE AS THE EQUIPMENT GROUND CONDUCTOR.

H. GROUND SHALL BE 5/8" DIAMETER, TEN (10) FEET LONG COPPER-CLAD STEEL. OBTAIN TWENTY FIVE (25) OHMS MAXIMUM RESISTANCE AS READ WITH AN OHM METER, USING TWO REFERENCE RODS. IF TWENTY FIVE (25) OHMS CANNOT BE ACHIEVED, CONTRACTOR SHALL PROVIDE ADDITIONAL RODS, UNTIL TWENTY FIVE FIVE (25) HAS BEEN OBTAIN.

CIRCUIT PROTECTIVE DEVICES

A. GENERAL:

1. UNLESS OTHERWISE INDICATED, PROTECTIVE DEVICES SHALL BE MOUNTED WITH TOP OF CABINET OR ENCLOSURE 6'- 6" ABOVE FINISHED FLOOR, SHALL BE PROPERLY ALIGNED, AND SHALL BE ADEQUATELY SUPPORTED INDEPENDENTLY OF THE CONNECTING RACEWAYS. ALL STEEL SHAPES, ETC., NECESSARY FOR THE SUPPORT OF THE EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. UNLESS OTHERWISE INDICATED, ALL BRANCH CIRCUIT PROTECTIVE DEVICES ENCLOSURES SHALL BE NEMA TYPE I, GENERAL PURPOSE TYPE. CIRCUIT PROTECTIVE DEVICES INSTALLED OUTDOORS OR EXPOSED TO THE WEATHER SHALL HAVE WEATHERPROOF ENCLOSURES, NEMA TYPE 4X STAINLESS STEEL 316.

2. INSTALL DISCONNECT SWITCHES FOR USE WITH MOTOR-DRIVEN APPLIANCES, AND MOTORS AND CONTROLLERS WITHIN SIGHT OF CONTROLLER POSITION UNLESS OTHERWISE INDICATED.

B. SAFETY SWITCHES:

1. ALL SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE. SWITCH MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK. COVER SHALL BE INTERLOCKED WITH MECHANISM TO PREVENT OPENING UNLESS SWITCH IS IN THE "OFF" POSITION. ALL ENCLOSURES SHALL BE PRIMED AND FINISHED TO RESIST RUSTING AND CORROSION. SWITCHES SHALL BE ITE, GENERAL ELECTRIC, SQUARE-D, OR CUTLER-HAMMER. (MATCH BUILDING STANDARD WHERE APPLICABLE)

C. FUSES:

1. ALL FUSES FOR SWITCHES SHALL BE DUAL ELEMENT, CARTRIDGE TYPE. FUSES SHALL BE BUSSMAN "FUSETRON" OR CHASE SHAWMUT "TRIONIC". THE CONTRACTOR SHALL FURNISH AND INSTALL PROPER SIZE FUSES WHERE REQUIRED FOR ALL FUSIBLE EQUIPMENT AND SHALL FURNISH TO THE OWNER A DUPLICATE CARTRIDGE FOR EACH FUSE TYPE INSTALLED.

2. FUSES FOR HVAC EQUIPMENT (ROOF TOP UNITS, CONDENSING AND AIR HANDLING UNITS) SHALL BE RK5 TYPE, TYPICAL UNLESS OTHERWISE NOTED. CONFIRM WITH HVAC EQUIPMENT NAME PLATE FOR SPECIFIC FUSE REQUIREMENTS.

PANELBOARDS:

A. PANELBOARDS SHALL BE CONNECTED DISTRIBUTED PHASE WITH CIRCUIT NUMBERING AS INDICATED ON THE DRAWINGS. PANELBOARDS SHALL HAVE CIRCUIT DIRECTORY CARDS AND SHALL BE COMPLETED WITH A TYPEWRITER BY THE CONTRACTOR TO INDICATE NEW AND EXISTING AREAS AND/OR DEVICES SERVED BY EACH CIRCUIT.

B. CIRCUIT BREAKERS FOR MOUNTING IN NEW PANELBOARDS OR DISTRIBUTION SECTION OF SWITCHBOARD SHALL BE MOLDED PLASTIC CASE, AIR CIRCUIT BREAKER TYPE. BREAKERS SHALL HAVE THERMAL-MAGNETIC TRIP UNITS AND MULTI-POLE BREAKERS SHALL HAVE A COMMON TRIP BAR SO THAT THE TRIPPING OF ONE POLE WILL AUTOMATICALLY TRIP ALL POLES OF THE BREAKER. BREAKERS SHALL BE TRIP FREE AND TRIP-INDICATING AND SHALL HAVE QUICK-MAKE, QUICK BREAK CONTACTS.

C. PANELBOARDS SHALL BE INSTALLED COMPLETE WITH CONNECTORS AND ASSOCIATED HARDWARE FOR ALL CIRCUIT BREAKERS AND SPACES LISTED IN THE PANELBOARD SCHEDULE.

D. PANELBOARDS TO BE DEADFRONT TYPE, WITH ALUMINMUM/COPPER BUS BARS, WITH BOLT-ON TYPE BRANCH CIRCUIT BREAKERS EQUAL TO SQUARE-D TYPE NQOD, NF, OR I-LINE AS APPLICABLE. ALL CIRCUIT BREAKERS SHALL BE CONCEALED BEHIND A HINGED, LOCKABLE DOOR INSTALLED ON THE FRONT PANELBOARD COVER.

E. ALL PANELBOARDS TO BE IDENTIFIED WITH ENGRAVED PLASTIC LAMINATE SIGNS. COORDINATE NAMES USED FOR IDENTIFICATION WITH CORRESPONDING DESIGNATIONS SHOWN, SPECIFIED OR SCHEDULED. FASTEN WITH SELF TAPPING STAINLESS STEEL SCREWS, OR CONTACT TYPE PERMANENT ADHESIVE WHERE SCREWS CAN NOT OR SHOULD NOT PENETRATE SUBSTRATE. INDICATE PANEL NAME, LOCATION, FEEDER, VOLTAGE, PHASE, WIRES, AND AMPERAGE.

F. INSTALL PANELBOARDS AND ENCLOSURES AS INDICATED, IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, APPLICABLE REQUIREMENTS OF NEC STANDARDS AND NECA'S "STANDARDS OF INSTALLATION", AND IN COMPLIANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PRODUCTS FULFILL REQUIREMENTS.

G. PANEL LOAD DATA IS BASED ON INFORMATION GIVEN TO ENGINEER AT THE TIME OF DESIGN. VERIFY ALL EQUIPMENT NAMEPLATE RATING BEFORE ORDERING.

H. TYPEWRITTEN CIRCUIT PANEL DIRECTORY SHALL BE PROVIDED INSIDE OF EACH PANELBOARD DOOR. CLEARLY IDENTIFY AREA AND TYPE OF LOAD SERVED BY EACH BRANCH CIRCUIT PROTECTIVE DEVICE, INCLUDING SPARES. HAND PRINTED WILL NOT BE ACCEPTED.

RECEPTACLES

A. ALL RECEPTACLES SHALL BE THE GROUNDING TYPE WITH GROUND CONNECTION MADE THROUGH AN EXTRA POLE WHICH SHALL BE PERMANENTLY CONNECTED TO GROUND CONDUCTOR.

B. RECEPTACLES FOR 20 AMPERE, 120V SERVICE SHALL BE THREE-WIRE, TWO POLE RECEPTACLES RATED 20 AMPERES AT 120 VOLTS. 15 AMPERE RECEPTACLES WILL BE ACCEPTABLE ON MULTI-OUTLET CIRCUITS. ALL NEW RECEPTACLES SHALL BE THAT OF LEVITON OR HUBBELL OR PRE-APPROVED EQUAL.

C. WALLPLATES: PROVIDE WALLPLATES FOR SINGLE AND COMBINATION WIRING DEVICES, OF TYPES, SIZES, AND WITH GANGING AND CUTOUTS AS INDICATED. SELECT PLATES WHICH MATE AND MATCH WIRING DEVICES TO WHICH ATTACHED. CONSTRUCT WITH METAL SCREWS FOR SECURING PLATES TO DEVICES; SCREW HEADS COLORED TO MATCH FINISH OF PLATES, WALLPLATES COLORED TO MATCH WIRING DEVICES AND ADJACENT WALL SURFACES. PROVIDE STAINLESS STEEL PLATES IN BREAK ROOM, FOOD SERVICE AND COUNTER AREAS.

D. ELECTRICAL CONTRACTOR SHALL CONFIRM RECEPTACLE CONFIGURATION, VOLTAGE, PHASE AND AMPERAGE FOR ALL EQUIPMENT FURNISHED AND INSTALLED FOR THIS WORK. ADVICE ENGINEER IF REQUIRED.

ALL REQUIRED DEVICES SHALL MATCH IN COLOR AND STYLE.
COLOR OF DEVICES AND PLATES SHALL BE DICTATED BY ARCHITECT AND OWNER.

MOTOR STARTERS:

A. MANUAL MOTOR STARTERS FOR 115V, 1Ø MOTORS (1) HORSEPOWER AND SMALLER, SHALL BE SINGLE POLE, HORSEPOWER RATED SWITCHES WITH THERMAL OVERLOAD UNITS AND HEATERS. STARTERS SHALL BE SQUARE-D CLASS 2510, WITH STAINLESS STEEL COVER PLATES.

LIGHTING FIXTURES:

A. CONTRACTOR SHALL INSTALL ALL LIGHTING FIXTURES AND PROVIDE NECESSARY MOUNTING HARDWARE. ALL RECESSED LIGHTING FIXTURES SHALL BE THERMALLY-PROTECTED AS REQUIRED BY CODE.

B. LIGHTING FIXTURES: FIXTURES SUPPORTED IN EXPOSED GRID CEILINGS SHALL BE PROVIDED WITH CLIPS. FIXTURES MOUNTED IN OR ON TILE CEILINGS SHALL BE ALIGNED WITH TILES. LIGHTING FIXTURES SHALL BE SUPPORTED FROM THE BUILDING STRUCTURAL MEMBERS EXCEPT FOR EXPOSED GRID CEILINGS WHERE A CEILING SUPPORTING WIRE SHALL BE PROVIDED AT EACH FIXTURE CORNER.

C. CONTRACTOR SHALL PROVIDE ONE COMPLETE SET OF LAMPS FOR ALL LIGHTING FIXTURES FURNISHED BY THE OWNER (UNLESS SHIPPED WITH FIXTURE). PROVIDE LABEL IN EACH FIXTURE INDICATING SIZE AND TYPE OF LAMP CORRESPONDING WITH SCHEDULE ON DRAWINGS.

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01.10.2022

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LMHT ENGINEER LICENSE NUMBER - C-1369

PROJECT: HIGHWAY 55 3.0 PROTOTYPE
1424 CURTIS BRIDGE ROAD
WILKSBORO, NC 28697

DRAWING: ELECTRICAL SPECIFICATIONS

Revisions

REVISION DATE

PROJECT DATE
01/07/2022

Drawn By
JP

Checked By
JP

Sheet No.
E701