1.27 UNIT PRICES

A. SUBMIT THE FOLLOWING LIST OF UNIT PRICES:

1. LIGHT FIXTURES -FOR EACH TYPE SPECIFIED ON DRAWINGS ($/FIXTURE).
2. RECEPTACLES - ADD/DEDUCT PRICE FOR EACH TYPE SPECIFIED ON DRAWINGS ($/RECEPTACLE).
3. DATA/TELEPHONE OUTLET -ADD/DEDUCT PRICE FOR WALL MOUNTED TELEPHONE OUTLET WITH 1" CONDUIT STUBBED INTO HUNG CEILING ($/OUTLET).
4. RACEWAYS - ALL SIZES ON PROJECT ($/LIN FT), CONDUCTORS ($/LIN FT), MC CABLE ($/LIN FT)
5. FIRE ALARM DEVICES.
6. ELECTRICAL PANELS - ALL TYPES INDICATED ON DRAWINGS.
7. TRANSFORMERS - ALL RATINGS INDICATED ON DRAWINGS.

PART 2 PRODUCT/APPLICATION

2.01 RACEWAYS

A. EMT: ANSI C80.3, ZINC-COATED STEEL, WITH SET-SCREW OR COMPRESSION FITTINGS.

B. FMC: ZINC-COATED STEEL.

C. RMC: ANSI C80.1, HOT-DIPPED GALVANIZED STEEL WITH THREADED FITTINGS.

D. IMC: ANSI C80.6, ZINC-COATED STEEL, WITH THREADED FITTINGS.

E. LFMC: ZINC-COATED STEEL WITH SUNLIGHT-RESISTANT AND MINERAL-OIL-RESISTANT PLASTIC JACKET.

F. RACEWAY FITTINGS: SPECIFICALLY DESIGNED FOR THE RACEWAY TYPE WITH WHICH USED.

G. ELECTRIC METALLIC TUBING SHALL BE INDUSTRY STANDARD THIN WALL CONDUIT, HOT DIPPED GALVANIZED STEEL (3/4" MIN, 4" MAX).

H. THE FLEXIBLE METALLIC CONDUIT SHALL BE OF THE GROUNDING TYPE. IT SHALL CONSIST OF GALVANIZED STEEL TAPE FORMED INTO AN INDUSTRY STANDARD INTERLOCKING COIL (3/4" MIN).

I. RIGID METAL CONDUIT SHALL BE INDUSTRY STANDARD STEEL CONDUIT (3/4" MIN, 4" MAX.

J. THREADED FITTINGS SHALL BE USED WITH RIGID CONDUIT. DOUBLE SET SCREW OR COMPRESSION FITTINGS SHALL BE USED WITH EMT.

2.02 WIRE AND CABLE

A. CONDUCTORS, NO. 12 AWG AND SMALLER: SOLID ALUMINUM.

B. CONDUCTORS, LARGER THAN NO. 12 AWG: STRANDED ALUMINUM.

C. INSULATION: THERMOPLASTIC, RATED AT 75 DEG C MINIMUM.

D. ALL CONDUCTORS SHALL BE SOFT 98% MINIMUM CONDUCTIVITY PROPERLY ALUMINUM, TYPE THHN/THWN INSULATED RATED AT 600V, UNLESS OTHERWISE NOTED.

E. REFER TO SECTION 3.09 FOR COLOR-CODING OF ALL WIRING.

2.03 SUPPORTING DEVICES

A. MATERIAL: COLD-FORMED STEEL, WITH CORROSION-RESISTANT COATING ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

B. METAL ITEMS FOR USE OUTDOORS OR IN DAMP LOCATIONS: HOT-DIP GALVANIZED STEEL.

C. SLOTTED-STEEL CHANNEL SUPPORTS: FLANGE EDGES TURNED TOWARD WEB AND 9/16-INCH DIAMETER SLOTTED HOLES AT A MAXIMUM OF 2 INCHES O.C., IN WEBS.

D. SLOTTED-STEEL CHANNEL SUPPORTS: COMPLY WITH DIVISION 5 SECTION "METAL FABRICATIONS" FOR SLOTTED CHANNEL FRAMING.

1. CHANNEL THICKNESS: SELECTED TO SUIT STRUCTURAL LOADING.
2. FITTINGS AND ACCESSORIES: PRODUCTS OF THE SAME MANUFACTURER AS CHANNEL SUPPORTS.

E. NONMETALLIC CHANNEL AND ANGLE SYSTEMS: STRUCTURAL-GRADE, FACTORY-FORMED, GLASS-FIBER-RESIN CHANNELS AND ANGLES WITH 9/16-INCH- DIAMETER HOLES AT A MAXIMUM OF 8 INCHES O.C., IN AT LEAST ONE SURFACE.

1. FITTINGS AND ACCESSORIES: PRODUCTS OF THE SAME MANUFACTURER AS CHANNELS AND ANGLES.
2. FITTINGS AND ACCESSORY MATERIALS: SAME AS CHANNELS AND ANGLES, EXCEPT METAL ITEMS MAY BE STAINLESS STEEL.

F. RACEWAY AND CABLE SUPPORTS: MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING-STEEL CLAMPS OR CLICK-TYPE HANGERS.

G. PIPE SLEEVES: ASTM A 53, TYPE E, GRADE A, SCHEDULE 40, GALVANIZED STEEL, PLAIN ENDS.

H. CABLE SUPPORTS FOR VERTICAL CONDUIT: FACTORY-FABRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUG FOR NONARMORED ELECTRICAL CABLES IN RISER CONDUITS. PLUGS HAVE NUMBER AND SIZE OF CONDUCTOR GRIPPING HOLES AS REQUIRED TO SUIT INDIVIDUAL RISERS. BODY CONSTRUCTED OF MALLEABLE-IRON CASTING WITH HOT-DIP GALVANIZED FINISH.

I. EXPANSION ANCHORS: CARBON-STEEL WEDGE OR SLEEVE TYPE.

J. TOGGLE BOLTS: ALL-STEEL SPRINGHEAD TYPE.

K. POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL

L. PROVIDE ALL STEEL SUPPORTING MEMBERS, HANGERS, BRACKETS OR OTHER SPECIAL DETAILS REQUIRED AND NECESSARY AS PER CODE.

M. EXCEPT FOR BRANCH CIRCUITRY INSTALL ALL CONDUIT IN HUNG CEILING SPACE ON ACCEPTABLE HANGERS AND INSERTS. CONDUIT OR MC CABLE FOR BRANCH CIRCUITRY SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS SECURED TO THE CEILING SUPPORT SYSTEM (BLACK IRON - NYC), FROM STRUCTURAL MEMBERS OR FROM THE DECK. SUPPORT FROM CEILING TEES, CROSS TEES OR SUPPORT WIRES IS PROHIBITED.

N. SPACING OF SUPPORTS SHALL BE PER THE NEC.

O. INSERTS ARE TO BE OF A LEAD SHIELD TYPE.

P. HANGERS MUST NOT BE WELDED TO STRUCTURAL STEEL MEMBERS AND BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED.

Q. SLEEVES ARE TO BE OF A TYPE SUITABLE FOR THE APPLICATION AND BE SEALED AND MADE WATERTIGHT. SLEEVES THROUGH CONCRETE SHALL BE SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT AND INSTALLED FLUSH WITH UNDERSIZE OF CONCRETE SLAB AND EXTEND 4" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

2.04 PULLBOXES, JUNCTION BOXES AND OUTLET BOXES

A. PULLBOXES, JUNCTION BOXES AND OUTLET BOXES SHALL BE MANUFACTURED FROM GALVANIZED INDUSTRY STANDARD GAUGE SHEET STEEL.

B. PROVIDE PULL BOXES AND JUNCTION BOXES IN LONG STRAIGHT RUNS OF RACEWAY TO ASSURE THAT CABLES ARE NOT DAMAGED WHEN THEY ARE PULLED, TO FULFILL REQUIREMENTS AS TO THE NUMBER OF BENDS PERMITTED IN RACEWAY BETWEEN CABLE ACCESS POINTS, THE ACCESSIBILITY OF CABLE JOINTS AND SPLICES, AND THE APPLICATION OF CABLE SUPPORTS.

C. PULLBOXES AND JUNCTION BOXES SHALL BE SIZED SO THAT THE MINIMUM BENDING RADIUS CRITERIA SPECIFIED FOR THE WIRES AND CABLE ARE MAINTAINED.

D. SWITCH RECEPTACLE AND WALL OUTLET BOXES SHALL BE A NOMINAL 4" SQUARE, 1-1/2" OR 2-1/8" DEEP AS REQUIRED BY CODE WITH A RAISED COVER, UNLESS OTHERWISE INDICATED ON THE DRAWING.

E. PROVIDE BLANK COVERPLATES FOR BOXES WITHOUT WIRING DEVICES.

F. DO NOT INSTALL OUTLET BOXES BACK TO BACK IN PARTITIONS. STAGGER TO PREVENT SOUND TRANSFER.

G. TWO OR MORE OUTLET BOXES THAT OCCUR AT THE SAME LOCATION SHALL BE GANGED TOGETHER IN THE SAME COVERPLATE UNLESS OTHERWISE NOTED.

H. LIGHTING FIXTURE BOXES SHALL BE 4" OCTAGON TYPE, DEPTH AS REQUIRED WITH 3/8" FIXTURE STUD. FOR SUSPENDED CEILING WORK, PROVIDE A 4" OCTAGON BOX WITH REMOVABLE BACKPLATE WHERE REQUIRED.

I. PULL/JUNCTION BOX BARRIERS SHALL BE PROVIDED WHERE REQUIRED BY CODE.

J. INSTALL JUNCTION AND PULL BOXES IN INCONSPICUOUS LOCATIONS.

K. A MINIMUM OF ONE PULL BOX SHALL BE INSTALLED FOR EVERY 100 FT OF CONDUITS. (NOTE: EACH 90 DEGREE BEND SHALL EQUATE TO 30' LENGTH OF CONDUIT).

L. NO MORE THAN TWO (2) 90 DEGREE BENDS SHALL BE INSTALLED BETWEEN ANY TWO ADJACENT PULL BOXES.

M. ALL EQUIPMENT, DEVICE BOXES, JUNCTION BOXES, PULL BOXES AND OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO THE BOX.

N. OUTLET BOXES SHALL BE PROVIDED FOR ALL LOW VOLTAGE DEVICES (I.E. TELEPHONE/DATA, SECURITY, FIRE ALARM, ETC.). COORDINATE BOX SIZE AND DEPTH WITH RESPECTIVE VENDOR.

2.05 WIRING DEVICES

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE, DECORATIVE STYLE, UNLESS OTHERWISE NOTED.

B. DEVICES GANGED TOGETHER IN MULTI-GANG BOX SHALL BE MOUNTED UNDER A SINGLE COVERPLATE.

C. LINE VOLTAGE SWITCHES SHALL BE 120/277 VOLTS, RATED AT 20 AMPERES, QUIET OPERATION ROCKER TYPE, DECORA STYLE.

D. RECEPTACLES

1. PROVIDE SPECIFICATION GRADE 20A. 120 VOLT, "U" GROUND RECEPTACLES, WITH MATCHING COVERPLATES. RECEPTACLES SHALL BE OF THE "DECORATOR STYLE".
2. REFER TO NOTES AND DETAILS FOR SPECIALITY RECEPTACLE COLORS.
3. RECEPTACLES TO HAVE CIRCUIT NUMBER IDENTIFIED ON THE WALL PLATE AND FURTHER IDENTIFIED WITH THE EXACT LOCATION LISTED IN THE PANEL DIRECTORY.
4. RECEPTACLES INSTALLED OUTDOORS SHALL BE GFCI TYPE AND PROVIDED WITH WEATHERPROOF WHILE-IN-USE COVER PASS AND SEYMOUR WIUCED SERIES OR APPROVED EQUAL.

2.06 SUPPORTS AND FASTENINGS

A. PROVIDE ALL STEEL SUPPORTING MEMBERS, HANGERS, BRACKETS OR OTHER SPECIAL DETAILS REQUIRED AND NECESSARY AS PER CODE.

B. EXCEPT FOR BRANCH CIRCUITRY INSTALL ALL CONDUIT IN HUNG CEILING SPACE ON ACCEPTABLE HANGERS AND INSERTS. CONDUIT OR MC CABLE FOR BRANCH CIRCUITRY SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS SECURED TO THE CEILING SUPPORT SYSTEM (BLACK IRON), FROM STRUCTURAL MEMBERS OR FROM THE DECK. SUPPORT FROM CEILING TEES, CROSS TEES OR SUPPORT WIRES IS PROHIBITED.

C. SPACING OF SUPPORTS SHALL BE PER THE NEC.

D. INSERTS ARE TO BE OF A LEAD SHIELD TYPE.

E. HANGERS MUST NOT BE WELDED TO STRUCTURAL STEEL MEMBERS AND BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED.

F. SLEEVES ARE TO BE OF A TYPE SUITABLE FOR THE APPLICATION AND BE SEALED AND MADE WATERTIGHT. SLEEVES THROUGH CONCRETE SHALL BE SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT AND INSTALLED FLUSH WITH UNDERSIZE OF CONCRETE SLAB AND EXTEND 4" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

2.07 DISCONNECT SWITCHES

A. INDOOR DISCONNECT SWITCHES SHALL BE "QUICK-MAKE, QUICK-BREAK," HEAVY DUTY TYPE IN NEMA 1 ENCLOSURES. PROVIDE ALL FUSES WHERE NOTED.

B. OUTDOOR DISCONNECT SWITCHES SHALL BE SIMILAR TO INDOOR, EXCEPT LISTED FOR OUTDOOR APPLICATIONS (NEMA 3R OR 4, AS REQUIRED).

C. FUSED DISCONNECT SWITCHES SHALL BE PROVIDED WITH FUSE CLIPS TO ACCEPT SPECIFIED FUSES.

2.08 FUSES

A. FUSES SHALL BE CURRENT LIMITING TYPE WITH A UL LISTED INTERRUPTING CAPACITY OF 200,000 RMS, UON.

B. FUSES RATED 600 AMPS AND BELOW SHALL BE CURRENT-LIMITING, DUAL-ELEMENT, TIME-DELAY UL CLASS RK-1 FOR NON-MOTOR CIRCUITS AND UL CLASS RK-5 FOR MOTOR CIRCUITS.

C. ALL FUSES SHALL BE OF THE SAME MANUFACTURER.

2.09 CIRCUIT BREAKERS

A. FOR PANELBOARD APPLICATIONS, CIRCUIT BREAKERS SHALL BE BOLTED TO THE PANELBOARD BUS BARS. WHERE CIRCUIT BREAKERS ARE INSTALLED IN EXISTING PANELBOARD BREAKERS SHALL BE OF THE SAME MANUFACTURER AND INTERRUPTING RATING. BREAKERS SHALL BE COMPATIBLE WITH EXISTING PANELBOARD.

B. CIRCUIT BREAKERS SHALL BE "THERMAL MAGNETIC" TYPE, QUICK-MAKE, QUICK-BREAK, TRIP-FREE WITH NON-WELDING CONTACTS COMPENSATED FOR AMBIENT TEMPERATURES AND SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 10,000 AMPERES SYMMETRICAL FOR 120/280V PANELS AND 14,000 AMPERES SYMMETRICAL FOR 277/480V PANELS OR HIGHER WHERE NOTED. CIRCUIT BREAKERS SHALL BE FULLY RATED. SERIES RATING IS NOT ACCEPTABLE.

C. MULTI-WIRE BRANCH CIRCUITS SUPPLYING POWER TO MORE THAN ONE DEVICE OR EQUIPMENT SHALL BE PROVIDED WITH A MEANS TO DISCONNECT SIMULTANEOUSLY ALL UNGROUNDED CONDUCTORS AT THE PANELBOARD WHERE THE BRANCH CIRCUIT ORIGINATES. CONTRACTOR SHALL COORDINATE WITH LOCAL AHJ THE MEANS REQUIRED TO MEET NEC SECTION 210.4(B). CONTRACTOR SHALL REMOVE AND REPLACE ALL EXISTING CIRCUIT BREAKERS THAT CAN NOT BE RETROFITTED WITH TIE BARS AS REQUIRED TO COMPLY WITH REQUIREMENT.

D. TANDEM BREAKERS SHALL NOT BE UTILIZED.

E. PROVIDE BREAKER LOCKS FOR ALL NEW AND EXISTING BREAKERS SERVING EXIT LIGHTS, EMERGENCY LIGHTING AND EMERGENCY BATTERY PACKS.

F. WHERE INDICATED TO BE LSI TYPE, CIRCUIT BREAKERS SHALL BE SOLID-STATE ELECTRONIC TRIP WITH FIELD-ADJUSTABLE LONG-TIME AND SHORT-TIME PICKUP LEVELS, LONG-TIME AND SHORT-TIME TIME ADJUSTMENTS, INSTANTANEOUS TRIP. PROVIDE ADJUSTABLE GROUND FAULT PICKUP AND TIME DELAY WHERE INDICATED.

2.10 PANELBOARDS

A. PANELBOARD BOXES SHALL BE MADE OF SHEET STEEL "BENT-UP" OR RIVETED OR BOLTED TOGETHER WITH EXTERIOR ANGLE IRON FRAME. BOX SHALL BE OF SUFFICIENT SIZE TO ALLOW A GUTTER AT LEAST 6" IN WIDTH ENTIRELY SURROUNDING EACH SECTION OF BOARD. PANELBOARDS SHALL BE SURFACE OR FLUSH TYPE AS NOTED ON THE DRAWINGS. PANEL BOX AND COVER SHALL BE GIVEN TWO COATS OF GRAY ENAMEL PAINT.

B. PROVIDE CODE GAUGE STEEL DOORS FOR ALL PANELBOARD BOXES. FRONT COVER SHALL BE A "DOOR WITHIN A DOOR" TYPE. THE OUTER DOOR (TRIM) SHALL ALLOW ACCESS TO ENTIRE PANELBOARD BOX INCLUDING GUTTER SPACES. OUTER DOOR (TRIM) SHALL BE ATTACHED DIRECTLY TO BOX BY A FULL LENGTH PIANO HINGE. THE INNER DOOR SHALL ALLOW ACCESS TO CIRCUIT BREAKERS ONLY. PROVIDE LOCK AND SET OF KEYS FOR INNER DOOR PER PANELBOARD.

C. PANEL BUS BARS SHALL BE COPPER PROPORTIONED FOR A CURRENT DENSITY OF 1000 AMPERES PER SQUARE INCH OF CROSS-SECTIONAL AREA. PROVIDE A COPPER EQUIPMENT GROUND BAR IN EACH PANEL, AND A COPPER ISOLATED GROUND BAR IN NOTED PANELS.

D. PANELS SHALL BE PROVIDED WITH NEUTRAL BARS SIZED AT 200% OF THE PHASE BUS BARS.

E. ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY. BRANCH MOUNTING IS NOT ACCEPTABLE.

F. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING PANELBOARDS AND/OR DISTRIBUTION PANELBOARDS SHALL BE INSTALLED ON A 4" HIGH CONCRETE BASE TO EXTEND 2" ON ALL SIDES WITH CHAMFERED CORNERS. ALL CONCRETE WORK TO BE INCLUDED, IN THIS DIVISION.

G. A TYPEWRITTEN LIST OF CIRCUITS SHOWING CLEARLY THE LOADS SUPPLIED BY EACH CIRCUIT SHALL BE INSTALLED ON THE INSIDE OF EACH PANEL BOARD DOOR. THIS LIST SHALL BE MOUNTED IN A STEEL FRAME UNDER A PLASTIC WINDOW. EACH PANEL SHALL BE EXTERNALLY TAGGED WITH PERMANENT LAMACOID PLATE INDICATING PANEL DESIGNATION AND VOLTAGE. PANEL DIRECTORY SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLING IN PANELBOARD. LOAD DESCRIPTION SHALL INCLUDE COLUMN GRID LINES, ROOM NUMBERS, OR OTHER INFORMATION TO CLEARLY DISTINGUISH LOAD LOCATION.

H. PHASE LEGS OF ALL PANELS SHALL BE BALANCED AT SUPPLY POINT TO WITHIN 10% AFTER ALL CIRCUITS ARE WIRED AND LOADS CONNECTED.

I. ALL PANELBOARDS SHALL HAVE A MINIMUM SHORT CIRCUIT RATING AS INDICATED ON DRAWINGS. EQUIPMENT SHALL BE FULLY RATED. SERIES RATING IS NOT ACCEPTABLE.

2.11 LOW VOLTAGE TRANSFORMERS

A. THREE PHASE TRANSFORMERS SHALL BE 480 VOLT DELTA PRIMARY AND 208/120 VOLT WYE SECONDARY IN A NEMA 1 VENTILATED ENCLOSURE, UNLESS OTHERWISE NOTED. TRANSFORMERS SHALL HAVE A MINIMUM OF TWO 2-1/2% FULL CAPACITY PRIMARY TAPS ABOVE AND FOUR 2-1/2% FULL CAPACITY PRIMARY TAPS BELOW NORMAL PRIMARY VOLTAGE. ADJUST SECONDARY VOLTAGE TO BE 208/120 WHEN INSTALLED.

B. TRANSFORMERS 15KVA AND ABOVE SHALL BE 115 DEGREE CENTIGRADE TEMPERATURE RISE ABOVE 40 DEGREES CENTIGRADE AMBIENT BASED UPON A 220°C INSULATION SYSTEM.

C. TRANSFORMERS SHALL BE PROVIDED WITH COPPER WINDINGS.

D. TRANSFORMERS NOTED AS FLOOR MOUNTED SHALL BE INSTALLED WITH VIBRATION ISOLATION.

E. TRANSFORMERS SHALL COMPLY WITH DEPARTMENT OF ENERGY 2016 ENERGY EFFICIENT REQUIREMENTS.

2.12 LIGHTING FIXTURES

A. ALL LIGHTING FIXTURE MOUNTING HARDWARE SHALL MATCH AND BE COORDINATED WITH THE NEW CEILING SYSTEM TYPE. ALL FIXTURES SHALL BE EQUIPPED WITH "EARTHQUAKE" CLIPS. ALL LIGHTING FIXTURES SHALL BE INSTALLED WITH SEISMIC BRACING AS INDICATED ON ARCHITECTURAL CEILING DETAILS.

B. ALL FIXTURES SHALL BE FREE OF LIGHT LEAKS BELOW CEILING.

C. REFER TO ARCHITECTURAL DRAWINGS FOR ALL LIGHTING FIXTURE SPECIFICATIONS.

D. ALL FIXTURES SHALL BE COMPLETE WITH NEW LAMPS, BALLASTS, DRIVERS, ACCESSORIES AND MOUNTING APPURTENANCES.

E. ALL LIGHT FIXTURES SHALL BE U.L. APPROVED.

F. CONTRACTOR SHALL AIM AND ADJUST ALL LIGHT FIXTURES IN PRESENCE OF LIGHTING CONSULTANT.

2.13 GROUNDING

A. PROVIDE SUPPLEMENTARY GROUND BONDING WHERE METALLIC CONDUITS TERMINATE AT METAL CLAD EQUIPMENT (OR AT THE METAL PULL BOX OF EQUIPMENT) FOR WHICH A GROUND BUS IS SPECIFIED WITH A BUSHING OF THE GROUNDING TYPE CONNECTED INDIVIDUALLY TO GROUND BUS.

B. GROUND ALL EQUIPMENT IN ACCORDANCE WITH LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. PROVIDE SEPARATE GREEN INSULATED GROUND CONDUCTOR IN EVERY CONDUIT TO ALL DEVICES, LIGHTING FIXTURES AND FEEDERS (PANELBOARDS, DISCONNECT SWITCHES, ETC.).

C. ALL GROUND WIRES SHALL BE SUITABLY PROTECTED FROM MECHANICAL INJURY.

D. SPECIALTY GROUNDING AS DETAILED ON THE DESIGN DRAWINGS OR REQUESTED AS ELECTRICAL CONTRACTOR SCOPE BY OTHER CONSULTANTS DOCUMENTS.

E. BOND EACH RGS CONDUIT TERMINATION USING A PROPERLY SIZED GROUND WIRE BONDED TO THE GROUND WIRE INSTALLED IN THAT CONDUIT.

2.14 SELF-POWERED EXIT SIGNS

A. FURNISH AND INSTALL SELF-POWERED EXIT SIGNS COMPLETE WITH INTEGRAL BATTERY/CHARGER CAPABLE OF OPERATING THE SIGN FOR 90 MINUTES IN THE EVENT OF A POWER FAILURE.

B. UNIT SHALL HAVE SEALED NICKEL CADMIUM BATTERY, LED ILLUMINATORS, TEST BUTTON AND INDICATING LIGHT.

C. BATTERY/CHARGER PACK SHALL BE MOUNTED ABOVE THE SIGN. CEILING MOUNTED SIGNS SHALL BE ARRANGED SO THAT THE PACK IS RECESSED ABOVE THE CEILING. WALL MOUNTED SIGNS SHALL HAVE CONCEALED BATTERY PACKS.

D. EDGE LIT PANEL SHALL HAVE "EXIT" IN RED LETTERING, 6" HIGH OR 8" HIGH IN PLACES OF ASSEMBLY OR WHERE REQUIRED BY CODE.

E. EXIT SIGNS SHALL MATCH BUILDING STANDARD OR BE MANUFACTURED BY ATLITE, ENCORE, LIGHT ALARMS, OR APPROVED EQUAL.

F. SINGLE FACE AND DOUBLE FACE EXIT SIGNS SHALL BE PROVIDED WITH MYLAR BACKING.

G. EXIT SIGN SHALL BE UL LISTED AND SHALL MEET THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.

2.15 MOTORS AND APPARATUS FURNISHED BY OTHERS

A. INSTALL ALL WIRING IN CONDUITS. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH 18" TO 24" OF FLEXIBLE CONDUIT FROM END OF CONDUIT TO MOTOR TERMINAL BOX.

B. PROVIDE CONNECTIONS TO ALL "EXISTING TO BE RELOCATED" AS WELL AS NEW MOTORS, CONTROLLERS, DISCONNECTS, ACTUATING AND CONTROL DEVICES. CONDUCTORS TO MOTORS TO BE THE SAME AS TO CONTROLLERS EXCEPT AS NOTED.

C. MOTORS, CONTROLLERS, ACTUATING AND CONTROL DEVICES WILL BE SUPPLIED UNDER SECTIONS OF WORK EXCEPT AS NOTED.

D. ACCEPT DELIVERY OF CONTROLLERS, OR RELOCATE EXISTING CONTROLLERS, ERECT ON WALLS OR ABOVE CEILING AS INDICATED AND WIRE UNDER THIS SECTION EXCEPT AS NOTED.

E. WIRE ALL MOTOR AND ACTUATING DEVICES SUPPLIED AND INSTALLED UNDER OTHER SECTIONS OF WORK EXCEPT AS NOTED.

F. FURNISH DISCONNECT SWITCHES UNDER THIS SECTIONS OF WORK EXCEPT AS NOTED.

G. LEAVE MOTOR, CONTROL AND ACTUATING EQUIPMENT READY FOR OPERATION.

H. ASCERTAIN EXACT LOCATIONS OF CONTROLLERS AND CONTROL SERVICES PRIOR TO INSTALLATION AND PULLING WIRING.

I. COORDINATE WITH ALL OTHER TRADES AND PROVIDE ALL WIRING, CONDUIT, JUNCTION BOXES, DISCONNECTS, CONNECTIONS AND TERMINATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER WIRING AND NECESSARY ELECTRICAL ADJUSTMENTS AS REQUIRED BY THE EQUIPMENT SPECIFICATION.

J. UNLESS OTHERWISE NOTED, ALL STARTERS AND CONTROL WIRING TO BE PROVIDED BY DIVISION 23. DIVISION 26 TO RECEIVE, INSTALL STARTERS AND PROVIDE ALL LINE-SIDE AND LOAD-SIDE POWER WIRING AND REQUIRED ISOLATING DISCONNECT SWITCHES.

K. CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH DIVISION 23 PRIOR TO INSTALLATION

2.16 CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED UNDER THIS CONTRACT AND BE ACCEPTABLE TO THE OWNER. OBTAIN WRITTEN APPROVAL FROM OWNER BEFORE ANY CUTTING IS CARRIED OUT.

B. WHERE CONDUITS PASS THROUGH FIRE RATED WALLS OR FLOORS, PROVIDE FIRE STOPPING MATERIAL LISTED WITH, AND BEAR LABEL OF CSA AND ULC, AND MAINTAIN SAME FIRE RATING OF BUILDING COMPONENT PENETRATION.

2.17 BALANCING AND METERING

A. MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND SUBMIT A REPORT FOR INSERTION INTO MANUALS.

B. METER ALL POWER CIRCUIT FEEDERS. IF GROUND RESISTANCE ON ANY CIRCUIT IS LESS THAN THAT REQUIRED BY NEC OR OTHER GOVERNING REGULATIONS, SUCH CIRCUITS ARE TO BE CONSIDERED DEFECTIVE AND MUST BE REPLACED.

2.18 ELECTRICAL IDENTIFICATION

A. IDENTIFICATION DEVICES: A SINGLE TYPE OF IDENTIFICATION PRODUCT FOR EACH APPLICATION CATEGORY. USE COLORS PRESCRIBED BY ANSI A13.1, NFPA 70, AND THESE SPECIFICATIONS.

B. RACEWAY AND CABLE LABELS: COMPLY WITH ANSI A13.1, TABLE 3, FOR MINIMUM SIZE OF LETTERS FOR LEGEND AND MINIMUM LENGTH OF COLOR FIELD FOR EACH RACEWAY AND CABLE SIZE.

1. TYPE: PRETENSIONED, WRAPAROUND PLASTIC SLEEVES. FLEXIBLE, PREPRINTED, COLOR-CODED, ACRYLIC BAND SIZED TO SUIT THE DIAMETER OF THE ITEM IT IDENTIFIES.
2. TYPE: PREPRINTED, FLEXIBLE, SELF-ADHESIVE, VINYL. LEGEND IS OVERLAMINATED WITH A CLEAR, WEATHER- AND CHEMICAL-RESISTANT COATING.
3. COLOR: BLACK LETTERS ON ORANGE BACKGROUND.
4. LEGEND: INDICATES VOLTAGE.

C. COLORED ADHESIVE MARKING TAPE FOR RACEWAYS, WIRES, AND CABLES: SELF-ADHESIVE VINYL TAPE, NOT LESS THAN 1 INCH WIDE BY 3 MILS THICK.

D. UNDERGROUND WARNING TAPE: PERMANENT, BRIGHT-COLORED, CONTINUOUS-PRINTED, VINYL TAPE WITH THE FOLLOWING FEATURES:

1. NOT LESS THAN 6 INCHES WIDE BY 4 MILS THICK (150 MM WIDE BY 0.102 MM THICK).
2. COMPOUNDED FOR PERMANENT DIRECT-BURIAL SERVICE.
3. EMBEDDED CONTINUOUS METALLIC STRIP OR CORE.
4. PRINTED LEGEND THAT INDICATES TYPE OF UNDERGROUND LINE.

E. TAPE MARKERS FOR WIRE: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND TYPE WITH PREPRINTED NUMBERS AND LETTERS.

F. COLOR-CODING CABLE TIES: TYPE 6/6 NYLON, SELF-LOCKING TYPE. COLORS TO SUIT CODING SCHEME.

G. ENGRAVED-PLASTIC LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK, MELAMINE PLASTIC LAMINATE PUNCHED OR DRILLED FOR MECHANICAL FASTENERS 1/16-INCH (1.6-MM) MINIMUM THICKNESS FOR SIGNS UP TO 20 SQ. IN. (129 SQ. CM) AND 1/8-INCH (3.2-MM) MINIMUM THICKNESS FOR LARGER SIZES. ENGRAVED LEGEND IN BLACK LETTERS ON WHITE BACKGROUND.

H. INTERIOR WARNING AND CAUTION SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145. PREPRINTED, ALUMINUM, BAKED-ENAMEL-FINISH SIGNS, PUNCHED OR DRILLED FOR MECHANICAL FASTENERS, WITH COLORS, LEGEND, AND SIZE APPROPRIATE TO THE APPLICATION.

I. EXTERIOR WARNING AND CAUTION SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145. WEATHER-RESISTANT, NON-FADING, PREPRINTED, CELLULOSE-ACETATE BUTYRATE SIGNS WITH 0.0396-INCH (1-MM), GALVANIZED-STEEL BACKING, WITH COLORS, LEGEND, AND SIZE APPROPRIATE TO THE APPLICATION. 1/4-INCH (6-MM) GROMMETS IN CORNERS FOR MOUNTING.

J. FASTENERS FOR NAMEPLATES AND SIGNS: SELF-TAPPING, STAINLESS-STEEL SCREWS OR NO. 10/32 STAINLESS-STEEL MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.

2.19 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

A. CURRENT-TRANSFORMER CABINETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL POWER UTILITY COMPANY.

B. METER SOCKETS: COMPLY WITH REQUIREMENTS OF ELECTRICAL POWER UTILITY COMPANY.

2.20 CONCRETE BASES

A. CONCRETE FORMS AND REINFORCEMENT MATERIALS: AS SPECIFIED IN OTHER SECTIONS OF THIS SPECIFICATION.

B. CONCRETE: 6" HIGH AS SPECIFIED IN OTHER SECTIONS OF THIS SPECIFICATION.

2.21 TOUCHUP PAINT

A. FOR EQUIPMENT: EQUIPMENT MANUFACTURER'S PAINT SELECTED TO MATCH INSTALLED EQUIPMENT FINISH.

B. GALVANIZED SURFACES: ZINC-RICH PAINT RECOMMENDED BY ITEM MANUFACTURER.

2.22 ACCEPTABLE MANUFACTURERS:

A. RECEPTACLES: PASS & SEYMOUR, LEVITON, OR HUBBELL

B. LIGHT SWITCHES: WATTSTOPPER, NLIGHT, OR LUTRON

C. DIMMER SWITCHES: WATTSTOPPER, NLIGHT, OR LUTRON

D. OCCUPANCY SENSORS: WATTSTOPPER, NLIGHT, OR LUTRON

E. RACEWAYS: NATIONAL WIRE PRODUCTS, TRIANGLE, OR REPUBLIC

F. WIRE/CABLE: SOUTHWIRE, GENERAL CABLE, OR CERRO

G. METAL CLAD CABLE: AFC, SOUTHWIRE, OR STABILOY

H. FITTINGS, COUPLINGS, BUSHINGS, CONNECTORS: OZ GEDNEY, BURNDY, NEPCO, OR THOMAS AND BETTS

I. DISCONNECT SWITCHES: EATON, GE, SQUARE D, OR SIEMENS

J. FUSES: BUSSMAN, MERSEN, OR LITTLEFUSE

K. CIRCUIT BREAKERS: EATON, GE, SQUARE D OR SIEMENS. MATCH BUILDING STANDARD

L. PANELBOARDS: EATON, SQUARE D OR SIEMENS.

M. TRANSFORMERS: HAMMOND POWER SOLUTIONS, EATON, SQUARE D, OR SIEMENS.

N. LAMPS: GE, SYLVANIA, OR PHILLIPS

O. BALLASTS: OSRAM SYLVANIA, ESB, OR UNIVERSAL

P. FLOOR BOXES POKE-THRU'S: WIREMOLD, HUBBELL, OR FSR

Q. WIREWAYS: HUBBELL OR WIREMOLD

R. TIME CLOCKS: TORK, INTERMATIC, OR APPROVED EQUAL

S. RELAY CONTROLS: WATTSTOPPER, LUTRON, TORK, OR APPROVED EQUAL

TO THE BEST KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.

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MANHATTAN BEER DISTRIBUTORS
20 DUNNIGAN DRIVE
SUFFERN, NEW YORK

KEY PLAN

REV	DESCRIPTION	DATE
	ISSUED FOR DOB SUBMISSION	09/10/2021
	ISSUED FOR BID	10/15/2021
	ISSUED FOR PROGRESS	01/18/2022
	ISSUED FOR BID	08/30/2022

DRAWN BY :	M.DIMATTIA
CHECKED BY :	B.NEMCHEK
APPROVED BY :	J.MIZRAHI
DATE :	09/10/21
SCALE :	N.T.S.

DRAWING TITLE :

ELECTRICAL SPECIFICATIONS
SHEET 2 OF 4

DWG NUMBER :

E-902