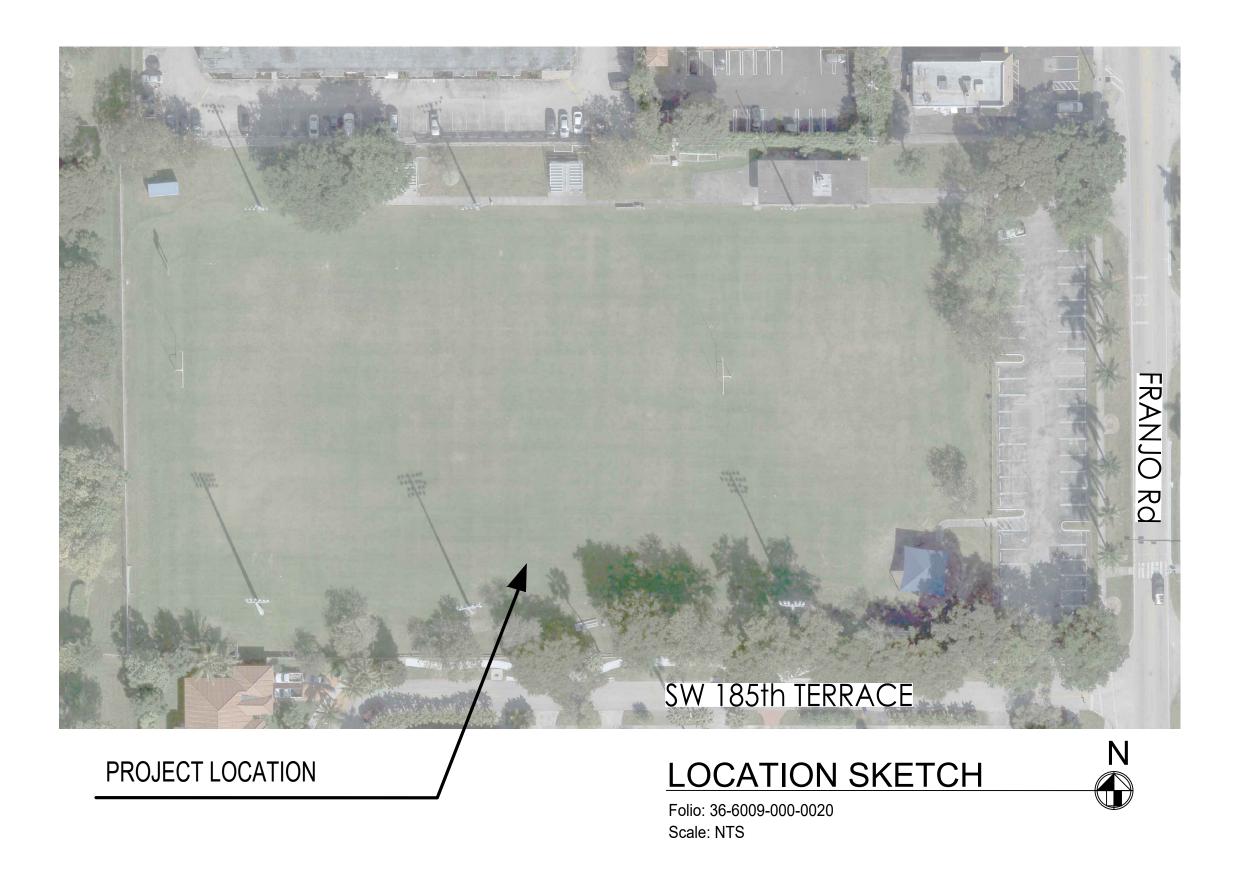
# TOWN OF CUTLER BAY BEL-AIRE FIELD LIGHTING IMPROVEMENTS

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| E-000        | COVER SHEET                     |  |  |  |  |  |  |  |
| E-001        | ELECTRICAL LEGEND SHEET         |  |  |  |  |  |  |  |
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| AGENCY    | SUBMITTAL<br>DATE | APPROVAL<br>DATE | PERMIT<br>NUMBER |
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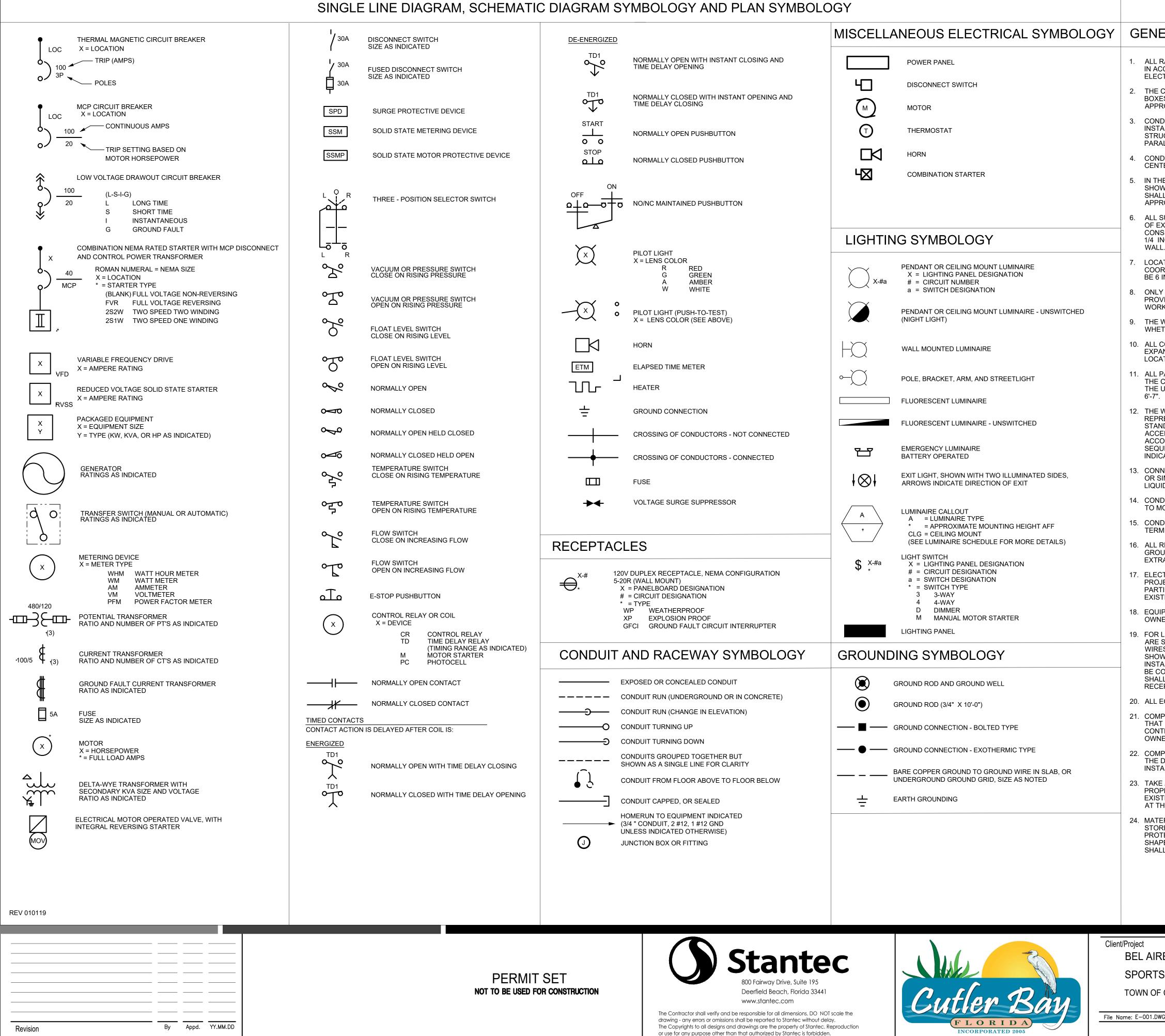
## TOWN OF CUTLER BAY

## **TOWN COUNCIL:**

TIM MEERBOTT, MAYOR MICHAEL P. CALLAHAN, VICE MAYOR ROBERT DUNCAN, COUNCIL MEMBER 1 SUZY LORD, COUNCIL MEMBER 2 RICHARD RAMIREZ, COUNCIL MEMBER 3

## PROJECT No. 215618048 DECEMBER 2022 PERMIT SET

APPROVED BY:



| RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED<br>CCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL<br>CTRICAL CODE AND APPLICABLE LOCAL CODES.   |   |
|---|---|
| CONTRACTOR SHALL VERIEY THE EXACT LOCATION OF TERMINAL<br>SAND CONDUIT ENTRANCES OF ALL GOUIREMENT AGAINS<br>ROVED SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.<br>DUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE<br>ALLED IN PERPENDICULAR TWENT CONFLICTS WITH EQUIPMENT OR<br>UCTURAL CONDITIONS. EXPOSED CONDUIT SHALL BE INSTALLED<br>UCTURAL CONDITIONS. EXPOSED CONDUIT SHALL BE INSTALLED<br>TREND OF TERMINAL BOXES.<br>UDIT STUB-UPS SHALL NOT BE MORE THAN 6 INCHES FROM THE<br>ERVIEND OF TERMINAL BOXES.<br>UDIT STUB-UPS SHALL NOT BE MORE THAN 6 INCHES FROM THE<br>TERLINE OF TERMINAL BOXES.<br>UDIT STUB-UPS SHALL NOT BE MORE THAN 6 INCHES FROM THE<br>TERLINE OF TERMINAL BOXES.<br>UDIT STUB-UPS SHALL NOT BE MORE THAN 6 INCHES FROM THE<br>TERLINE OF TERMINAL BOXES.<br>UDIT STUB-UPS SHALL NOT BE MORE THAN 7 ARE MODE.<br>SUBFROD SMUTTED PANIES AND PANELBOARDS ON THE INTERIOR<br>XUEFROR WALLS ABOVE GRADE OR IN OTHER LOCATIONS<br>UDITS THE DRAWINGS AND OTHER BOULPARES SHALL<br>ROVE PROPOSED CHANGES BEFORE THEY ARE MADE.<br>SUBFROD SMUTTED PANIES AND PANELBOARDS ON THE INTERIOR<br>XUEFROR WALLS ABOVE GRADE OR IN OTHER LOCATIONS AND SHALL<br>INCHES (IMINIMUM) AWR SPACE BETWEEN THE ENCLOSURE AND THE L.<br>. THAOR OF ULLBOXES ARE APPROXIMATE. THE CONTRACTOR SHALL<br>RDINATE EXACT LOCATION WITH EXISTING CONDITIONS AND SHALL<br>INCHES (IMINIMUM) AWR TERERENCED ON THE OXITANCTOR SHALL<br>NOTHER VERY ARE REFERENCED ON THE CONTRACTOR SHALL<br>RDINATE EXACT LOCATION WITH EXISTING CONDITIONS AND SHALL<br>INCHES (INTALLATION.<br>. WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS<br>. RANGING DAGRAMS. QUANTITY AND SIZE OF WIRES AND CONDUIT<br>RESENTA SUGGERAMISION JOINTS.<br>. ANALE GOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM<br>ANIONS OF EXPANSION AND DEFLECTION TYPE FITTINGS. FOR<br>ANIONS OF EXPANSION AND DEFLECTION TYPE FITTINGS. FOR<br>ANIONS OF CRAMSION AND DEFLECTION TYPE FITTINGS. FOR<br>ANIONS OF C | 4W       4-WIRE         A       AMPERES         ACC       AMPERE INTERRUPTING CAPACITY         AMPE       AMPERE INTERRUPTING CAPACITY         AMPE       AMPERES         AWG       AMERICAN WIRE GAUGE         BKR       BREAKER         C       CONDUIT, CELSIUS         G       GROUND         GFI       GROUND FAULT INTERRUPTER         GND       GROUND FOULT INTERRUPTER         GND       GROUND CODE         KA       KILOAMPERES         KLOK       KUCOUTS         KK       KULOYOLT-AMPERES         MCB       MAIN CIRCUIT BREAKER         MHZ       MEGAMERTZ         MLO       MAIN CIRCUIT BREAKER         MHZ       MEGAMERTZ         MEGAMERTZ       MEGAMERTZ         NEUTRAL       MECOTITAL         NEUTRAL       NATIONAL ELECTRICAL CODE         NEW       NOTIONAL ELECTRICAL CODE         SCCR |
|   |   |
|   |   |
|   |   |
| RE PARK ELECT   | RICAL LEGEND SHFFT  |
| RE PARK ELECT   | IRICAL LEGEND SHEET   |
| RE PARK ELECT   | Scale   |

Dwn. Chkd. Dsgn. YY.MM.DD

E-001

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|       | GENERAL ELECTRICAL  |   |
|-------|---|---|
| PART  | 1 - GENERAL   | F. SHOP DRAWINGS  |
| 1.01  | GENERAL   | 1. DRAWINGS SHALL INCLUDE IDE<br>GENERAL CONTRACTOR, SUBC                       |
| A.    | INCLUDE ALL AUXILIARIES AND ACCESSORIES FOR COMPLETE AND PROPERLY OPERATING SYSTEM.   | NUMBERED SEQUENTIALLY ANI   |
|       | ALL MATERIALS SHALL BE NEW AND FREE OF DEFECTS, AND SHALL BE UL LISTED, GEAR THE UL   | a. FABRICATION AND ERECTION   |
|       | LABEL OR BE LABELED OR LISTED WITH AN APPROVED, NATIONALLY RECOGNIZED ELECTRICAL<br>TESTING AGENCY. WHERE NO LABELING OR LISTING SERVICE IS AVAILABLE FOR CERTAIN TYPES OF  | b. ARRANGEMENTS AND SECT  |
|       | EQUIPMENT, TEST DATA SHALL BE SUBMITTED TO PROVE TO THE ENGINEER THAT EQUIPMENT MEETS OR EXCEEDS AVAILABLE STANDARDS.   | c. NECESSARY DETAILS, INCLU<br>OTHER WORK.                                      |
| C.    | PROVIDE AND INSTALL ALL ELECTRICAL SYSTEMS AND ANY NECESSARY ACCESSORIES AS PER THE   | d. KINDS OF MATERIAL AND FIN  |
|       | NATIONAL ELECTRICAL CODE (NEC) EDITION AS ADOPTED BY THE LOCAL AUTHORITY HAVING<br>JURISDICTION AND LOCAL CODES WHETHER OR NOT SPECIFIED HEREIN. THE CONTENT OF THESE       | e. DESCRIPTIVE NAMES OF EQ  |
|       | SPECIFICATIONS (DIVISION 26) AND CONTRACT DOCUMENTS IN GENERAL ONLY REFERS TO WORK  | f. MODIFICATIONS AND OPTIO  |
|       | REQUIRED ABOVE AND BEYOND THE REQUIREMENTS OF THE NEC AND APPLICABLE LOCAL CODES.   | g. LEAVE BLANK AREA, SIZE AF  |
| D.    | ALL WORK AND EQUIPMENT UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE WITH THE APPLICABLE PROVISIONS OF THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS IN      |   |
|       | FORCE AT THE TIME OF CONSTRUCTION.  | h. IN ORDER TO FACILITATE RE<br>NOTED, INDICATING BY CRO                        |
|       | 1. FLORIDA BUILDING CODE  | SPECIFICATIONS PARAGRAF<br>DOCUMENTS.   |
|       | 2. NATIONAL ELECTRICAL CODE (NEC)   | i. SEE SPECIFIC SECTIONS OF   |
| 1 02  | 3. REQUIREMENTS OF LOCAL POWER COMPANY<br>LAYOUT OF WORK  | j. PRODUCT DATA   |
|       | DRAWINGS ARE DIAGRAMMATIC, CORRELATE FINAL EQUIPMENT LOCATIONS WITH GOVERNING   | 2. SUBMIT TECHNICAL DATA VERI   |
| 7.    | ARCHITECTURAL AND STRUCTURAL DRAWINGS. LAY OUT BEFORE INSTALLATION SO THAT ALL  | REQUIREMENTS OF THE SPECI<br>NAME AND MODEL NUMBER, DI                          |
|       | TRADES MAY INSTALL EQUIPMENT IN SPACES AVAILABLE. PROVIDE COORDINATION AS REQUIRED FOR INSTALLATION IN A NEAT AND WORKMANLIKE MANNER.                                       | CLEARANCES REQUIRED. INDI<br>STANDARD ITEM AS CALLED FC                         |
| 1.03  | INVESTIGATION OF SITE   | DIMENSIONED AND IN CORREC   |
| A.    | CHECK SITE AND EXISTING CONDITIONS THOROUGHLY BEFORE BIDDING. ADVICE ENGINEER OF  |   |
| 1 0 1 | DISCREPANCIES OR QUESTIONS NOTED.<br>SUPERVISION OF THE WORK  | <ol> <li>IN ORDER TO FACILITATE REVIE<br/>NOTED, INDICATING BY CROSS</li> </ol> |
|       | PROVIDE FIELD SUPERINTENDENT WHO HAS HAD A MINIMUM OF FOUR (4) YEARS PREVIOUS   | SPECIFICATION PARAGRAPH N   |
| Λ.    | SUCCESSFUL EXPERIENCE ON PROJECTS OF COMPARABLE SIZE AND COMPLEXITY.  | 4. SEE SPECIFIC SECTIONS OF SF  |
|       | SUPERINTENDENT SHALL BE PRESENT AT ALL TIMES THAT WORK UNDER THIS DIVISION IS BEING<br>INSTALLED OR AFFECTED. SUPERINTENDENT SHALL HAVE PASSED A PROCTORED H.H. BLOCK       | G. PROCESSING SUBMITTALS  |
|       | JOURNEYMAN EXAM AND SHALL BE A LICENSED JOURNEYMAN. AT LEAST ONE MEMBER OF THE ELECTRICAL CONTRACTING FIRM SHALL HOLD A STATE MASTER CERTIFICATE OF COMPETENCY.             | 1. PRODUCT DATA: FOR STANDAF<br>COPIES AS REQUIRED UNDER I                      |
|       |   | COPIES OF NEW DATA.   |
|       | PROVIDE ALL REQUIRED COORDINATION AND SUPERVISION WHERE WORK CONNECTS TO OR IS  | 2. REFERENCE: "GENERAL COND   |
|       | AFFECTED BY WORK OF OTHERS, AND COMPLY WITH ALL REQUIREMENTS AFFECTING THIS DIVISION.<br>WORK REQUIRED UNDER OTHER DIVISIONS, SPECIFICATIONS OR DRAWINGS TO BE PERFORMED BY | 3. NOTE THAT THE REVIEW OF SH<br>ACCORDANCE WITH THE REQU                       |
|       | THIS DIVISION SHALL BE COORDINATED WITH THE CONTRACTOR AND SUCH WORK PERFORMED AT   | THE ENGINEER, ARCHITECT, OF<br>DIMENSIONAL ACCURACY OR D                        |
|       | NO ADDITIONAL COST TO OWNER.<br>BASIS FOR WIRING DESIGN   | INVOLVED, THE ABILITY TO THE  |
|       | THE DRAWINGS AND SPECIFICATIONS DESCRIBE SPECIFIC SIZES OF SWITCHES, BREAKERS,  | MECHANICAL/ELECTRICAL PER<br>NOT INVALIDATE THE PLANS AN                        |
| Λ.    | CONDUITS, CONDUCTORS, AND OTHER ITEMS OF WIRING EQUIPMENT. THESE SIZES ARE BASED ON   | SUCH CHANGE IS SUBMITTED A  |
|       | SPECIFIC ITEMS OF POWER CONSUMING EQUIPMENT. WHEREVER THE CONTRACTOR PROVIDES POWER CONSUMING EQUIPMENT WHICH DIFFERS FROM DRAWINGS AND SPECIFICATIONS, THE                 | H. DELAYS<br>1. CONTRACTOR IS RESPONSIBLE                                       |
|       | WIRING AND ASSOCIATED CIRCUIT COMPONENTS FOR SUCH EQUIPMENT SHALL BE CHANGED TO<br>MATCH AT NO ADDITIONAL EXPENSE TO THE OWNER.   | INDIRECTLY FROM LATE SUBMI  |
| 1.07  | PROTECTION AND CLEAN UP   | OR SAMPLES.   |
| A.    | SUITABLY PROTECT ALL EQUIPMENT FURNISHED UNDER THIS DIVISION DURING CONSTRUCTION.   | 1.11 PROGRESS AND RECORD DRAWIN<br>A. KEEP TWO SETS OF BLACK OR BL              |
|       | RESTORE ALL DAMAGED SURFACES AND ITEMS TO "LIKE NEW" CONDITION BEFORE A REQUEST FOR SUBSTANTIAL COMPLETION INSPECTION.  | DRAWINGS EACH DAY AS COMPO  |
| 1.08  | MATERIALS   | DIFFERENT COLORED PENCILS SH<br>DRAWING SHALL BE SHOWN IN AC                    |
| A.    | REFERENCE: "GENERAL CONDITIONS OF THE CONTRACT".  | TO AGREE WITH ITEMS ACTUALLY  |
| В.    | WHERE A MANUFACTURER'S MODEL NUMBER IS LISTED, THIS MODEL SHALL SET THE STANDARD OF<br>QUALITY AND PERFORMANCE REQUIRED. WHERE NO BRAND NAME IS SPECIFIED, THE SOURCE AND   | B. PRIOR TO REQUEST FOR FINAL PA<br>AND TWO SETS OF PRINTS TO THE               |
|       | QUALITY AND PERFORMANCE REQUIRED. WHERE NO BRAND NAME IS SPECIFIED, THE SOURCE AND QUALITY SHALL BE SUBJECT TO ENGINEER'S REVIEW AND ACCEPTANCE.                            | 1.12 OPERATING INSTRUCTIONS   |
| 1.09  | SUBSTITUTIONS   | A. SUBMIT FOR CHECKING A SPECIFI  |
| A.    | EACH BIDDER REPRESENTS THAT HIS BID IS BASED UPON THE EQUIPMENT AND MATERIALS<br>DESCRIBED IN DIVISION 26 OF THE SPECIFICATIONS.  | WHICH REQUIRE INSTRUCTIONS T<br>INSERTION IN EACH TECHNICAL IN                  |
| В     | SUBSTITUTION SUBMITTALS SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH   | 1.13 MAINTENANCE INSTRUCTIONS   |
|       | IT IS TO BE SUBSTITUTED, DRAWINGS, CUTS, PERFORMANCE AND TEST DATA AND ANY OTHER  | A. SUBMIT FOR APPROVAL MAINTEN  |
|       | INFORMATION NECESSARY FOR THE ENGINEER TO DETERMINE THAT THE EQUIPMENT MEETS ALL<br>SPECIFICATIONS AND REQUIREMENTS. PRE-APPROVAL OF PROPOSED SUBSTITUTION IS REQUIRED      | INSTRUCTIONS AND PARTS LISTS<br>INFORMATION IN EACH TECHNICA                    |
|       | FOR EQUIPMENT SUPPLIED UNDER THIS DIVISION AND MUST BE SUBMITTED 10 DAYS PRIOR TO BID<br>OPENING.   | 1.14 SYSTEMS GUARANTEE  |
| C.    | SUBSTITUTED EQUIPMENT OR OPTIONAL EQUIPMENT WHERE PERMITTED AND APPROVED, MUST  | A. THE WORK REQUIRED UNDER THI  |
|       | CONFORM TO SPACE REQUIREMENTS. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE<br>REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S             | GUARANTEE SHALL BE BY THE CC<br>OR MATERIAL WHICH HAS BEEN F                    |
|       | EXPENSE. ANY MODIFICATIONS OF RELATED SYSTEMS AS A RESULT OF SUBSTITUTIONS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.   | FOR A PERIOD OF ONE YEAR FROM<br>GUARANTEE SHALL NOT INCLUDE                    |
|       | TECHNICAL INFORMATION BROCHURES AND SUBMITTALS  | SUBSTANTIAL COMPLETION OF TH<br>OWNER AT THE "DEMONSTRATION                     |
|       | SUBMIT TECHNICAL INFORMATION BROCHURES AT START OF CONSTRUCTION OR WITHIN 30 DAYS   | OF WRITTEN OPERATING INSTRUC  |
|       | AFTER AWARD OF THE CONTRACT. PROVIDE CORRECT DESIGNATION ON COVER AND ON END OF BROCHURE.   | AFTER APPROVAL, PROVIDE ONE<br>BROCHURE.  |
|       | THE FIRST SHEET IN THE BROCHURE SHALL BE AN INDEX PAGE LISTING ALL EQUIPMENT CONTAINED  | 1.15 FINAL INSPECTION   |
| υ.    | IN THE BROCHURE WHICH PERTAINS TO THE PROJECT. THE SECOND SHEET SHALL BE PREPARED BY  | A. ALL WORK ON THE PROJECT SHAL   |
|       | THE CONTRACTOR, AND SHALL LIST MANUFACTURER'S AUTHORIZED REPRESENTATIVE FOR THIS PROJECT. THE THIRD SHEET SHALL LIST MANUFACTURER'S AUTHORIZED MAINTENANCE COMPANY          | SHALL BE SUBMITTED FOR APPRC<br>1.16 EQUIPMENT TO BE OF SINGLE MAI              |
|       | ADDRESSES FOR EQUIPMENT ON THIS PROJECT.  | A. IN GENERAL, ALL LIKE EQUIPMENT   |
| C.    | PROVIDE REINFORCED SEPARATION SHEETS TABBED WITH THE APPROPRIATE SPECIFICATION<br>REFERENCE NUMBER AND TYPED INDEX FOR EACH SECTION.  | MANUFACTURER.   |
| D.    | TECHNICAL INFORMATION CONSISTING OF MARKED CATALOG SHEETS OR SHOP DRAWINGS SHALL BE   | 1.17 GENERAL  |
|       | INSERTED IN THE BROCHURE IN PROPER ORDER ON ALL ITEMS HEREIN SPECIFIED OR SHOWN ON<br>DRAWINGS.   | A. WHERE THE REQUIREMENTS OF A<br>EXCEED THE REQUIREMENTS OF                    |
| E.    | THE GENERAL CONTRACTOR SHALL REVIEW THE BROCHURES BEFORE SUBMITTING TO THE  | 1.18 UTILITY COMPANY FEES, CHARGE   |
|       |   |   |
|       |   |   |
|       |   |   |
|       |   |   |
|       |   | PERMIT  |
|       |   | NOT TO BE USED FOR  |
|       |   |   |
|       |   |   |

SECTION 26 05 00

Revision

By Appd. YY.MM.DD

## ENGINEER. NO REQUEST FOR PAYMENT WILL BE CONSIDERED UNTIL THE BROCHURE HAS BEEN REVIEWED AND SUBMITTED FOR CHECKING.

#### ENTIFICATION OF PROJECT AND NAMES OF ARCHITECT, ENGINEER, CONTRACTOR AND/OR SUPPLIER AS APPLICABLE. DATA SHALL BE ID INDICATE IN GENERAL.

#### N DIMENSIONS

- IONAL VIEWS.
- UDING COMPLETE INFORMATION FOR MAKING CONNECTIONS WITH
- NISHES.
- UIPMENT.
- INS TO STANDARD EQUIPMENT REQUIRED BY THE CONTRACT. PPROXIMATELY 4 BY 2-1/2 INCHES, NEAR TITLE BLOCK (FOR
- EVIEW OF DRAWINGS, INSOFAR AS PRACTICABLE, THEY SHALL BE DSS REFERENCE THE CONTRACT DRAWINGS, NOTE, AND/OR PH NUMBERS WHERE ITEM(S) OCCUR IN THE CONTRACT
- SPECIFICATIONS FOR FURTHER REQUIREMENTS.
- IFYING THAT THE ITEM SUBMITTED COMPLIES WITH THE IFICATIONS. TECHNICAL DATA SHALL INCLUDE MANUFACTURER'S IMENSIONS, WEIGHTS, ELECTRICAL CHARACTERISTICS, AND ICATE ALL OPTIONAL EQUIPMENT AND CHANGES FROM THE OR IN THE SPECIFICATIONS. FURNISH DRAWINGS, OR DIAGRAMS, CT SCALE, COVERING EQUIPMENT, SHOWING ARRANGEMENT OF COORDINATION.
- EW OF PRODUCT DATA, INSOFAR AS PRACTICABLE, THEY SHALL BE S REFERENCE THE CONTRACT DRAWINGS, NOTE, AND/OR IUMBERS WHERE ITEM(S) OCCUR IN THE CONTRACT DOCUMENTS. PECIFICATIONS FOR FURTHER REQUIREMENTS.
- RD MANUFACTURED MATERIAL, PRODUCTS AND ITEMS SUBMIT DIVISION 1 SPECIFICATIONS. IF SUBMITTAL IS REJECTED, RESUBMIT
- DITIONS OF THE CONTRACT".
- HOP DRAWINGS, OR OTHER INFORMATION SUBMITTED IN JIREMENTS HEREINBEFORE SPECIFIED, DOES NOT ASSURE THAT OR ANY OTHER OWNER'S REPRESENTATIVE, ATTESTS TO THE DIMENSIONAL SUITABILITY OF THE MATERIAL OR EQUIPMENT E MATERIAL OR EQUIPMENT INVOLVED OF THE RFORMANCE OF EQUIPMENT. REVIEW OF SHOP DRAWINGS DOES ND SPECIFICATIONS IF IN CONFLICT, UNLESS A LETTER REQUESTING AND APPROVED ON THE ENGINEER'S LETTERHEAD.
- E FOR ANY DELAYS IN JOB PROGRESS ACCRUING DIRECTLY OR ISSIONS OR RE-SUBMISSIONS OF SHOP DRAWINGS, PRODUCT DATA,
- GS
- UE ON WHITE PRINTS AT THE JOB SITE. NEATLY MARKUP DESIGN NENTS ARE INSTALLED TAKING CARE TO REFLECT ANY VARIATIONS. HALL BE USED FOR DIFFERENT SYSTEMS. ALL ITEMS ON PROGRESS CTUAL LOCATION INSTALLED. CHANGE ANY EQUIPMENT SCHEDULES (FURNISHED.
- AYMENT FURNISH A SET OF "AS-BUILT" DRAWINGS IN PDF FORMAT IE ENGINEER, UNLESS OTHERWISE SPECIFIED.
- IC SET OF WRITTEN OPERATING INSTRUCTIONS ON EACH ITEM TO OPERATE. AFTER APPROVAL, PROVIDE ONE COPY FOR NFORMATION BROCHURE.
- ANCE INFORMATION CONSISTING OF MANUFACTURER'S PRINTED FOR EACH MAJOR ITEM OR EQUIPMENT. AFTER APPROVAL, INSERT L INFORMATION BROCHURE.
- IS DIVISION SHALL INCLUDE A ONE-YEAR GUARANTEE. THIS ONTRACTOR TO THE OWNER FOR ANY DEFECTIVE WORKMANSHIP FURNISHED UNDER THIS CONTRACT AT NO COST TO THE OWNER OM THE DATE OF SUBSTANTIAL COMPLETION OF THE SYSTEM. THIS E LIGHT BULBS IN SERVICE AFTER ONE MONTH FROM DATE OF HE SYSTEM. EXPLAIN THE PROVISIONS OF GUARANTEE TO THE N OF COMPLETED SYSTEM". SUBMIT FOR CHECKING A SPECIFIC SET CTIONS ON EACH ITEM WHICH REQUIRE INSTRUCTIONS TO OPERATE. COPY FOR INSERTION IN EACH TECHNICAL INFORMATION
- LL BE COMPLETED, AND ALL FORMS AND OTHER INFORMATION OVAL ONE WEEK BEFORE THE REQUEST FOR FINAL INSPECTION.
- SHALL BE SUPPLIED AND MANUFACTURED BY SAME
- ANOTHER DIVISION, SECTION OR PART OF THESE SPECIFICATIONS THIS DIVISION, THOSE REQUIREMENTS SHALL GOVERN. ES, COSTS

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE REQUIRED UTILITY COMPANY TO DETERMINE IF ANY FEES, CHARGES OR COSTS WILL BE DUE THE UTILITY COMPANY. FEES FOR TEMPORARY POWER SHALL BE INCLUDED IN THIS CONTRACTOR'S BID PRICE. FEES FOR PERMANEI POWER WILL BE PAID BY THE OWNER.
  - END OF SECTION
  - SECTION 26 05 30

#### RACEWAYS AND CONDUITS

- PART 1 GENERAL
- 1.01 DESCRIPTION
- A. DESCRIPTION OF SYSTEM
- 1. ALL EXPOSED CONDUIT SHALL BE RIGID ALUMINUM UNLESS OTHERWISE INDICATED. UNDERGROUND CONDUIT IS PERMITTED TO BE PVC. TRANSITION FROM ALUMINUM TO PVC CONDUIT SHALL BE PRIOR TO THE ELBOW AND TRANSITION ABOVE GRADE. ALL ALUMINUM CONDUIT IN CONTACT WITH CONCRETE OR EARTH SHALL HAVE CORROSION RESISTANT BITUMINOUS COATING. THE COATING SHALL EXTEND AT LEAST 4-INCHES AFTER EMERGENCE FROM CONCRETE OR EARTH.
- 2. MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS NOTED OTHERWISE ON DRAWINGS.
- 3. ALL CONDUITS SHALL BE UL LISTED AND LABELED.
- 4. CONDUIT SIZES SHOWN ON THE DRAWINGS ARE TO AID THE CONTRACTOR IN BIDDING ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONDUIT SIZES AS REQUIRED BY NEC FILL TABLES.
- PART 2 PRODUCTS 2.01 PVC CONDUIT
- A. PROVIDE RIGID NON-METALLIC CONDUIT MANUFACTURED FROM SCHEDULE [[[40]]] [[[80]]] PVC, AS INDICATED, AND SUNLIGHT-RESISTANT.
- B. PROVIDE RIGID NON-METALLIC CONDUIT MANUFACTURED IN ACCORDANCE WITH NEMA TC-2 -ELECTRICAL PLASTIC TUBING AND CONDUIT, AND UL-651 - STANDARD FOR RIGID NON-METALLIC CONDUIT.
- C. MANUFACTURER, OR EQUAL
- 1. CARLON
- 2. CANTEX
- 2.02 RIGID ALUMINUM (RAL) CONDUITS
- A. PROVIDE RIGID ALUMINUM CONDUIT MANUFACTURED FROM 6063 ALLOY, TEMPER T-1.
- B. PROVIDE RIGID ALUMINUM CONDUIT MANUFACTURED IN ACCORDANCE WITH NEMA C80.5 -ELECTRICAL RIGID ALUMINUM CONDUIT, AND UL-6A - ELECTRICAL RIGID METAL CONDUIT - ALUMINU RED BRASS AND STAINLESS STEEL.
- C. MANUFACTURER, OR EQUAL
- 1. V.A.W. OF AMERICA
- 2. ALCOA
- 2.03 EXPANSION FITTINGS
- A. CONDUIT EXPANSION FITTINGS SHALL BE PVC AND SHALL HAVE AN EXPANSION CHAMBER TO ALLOW APPROXIMATELY TWO-INCH MOVEMENT PARALLEL TO CONDUIT RUN IN EITHER DIRECTION FROM NORMAL. THEY SHALL HAVE FACTORY-INSTALLED PACKING. EXPANSION FITTINGS SHALL BE SPACE AS RECOMMENDED BY THE MANUFACTURER.
- PART 3 EXECUTION
- 3.01 INSTALLATION
- A. ALL RACEWAYS SHALL BE RUN IN NEAT AND WORKMAN LIKE MANNER AND SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH LATEST EDITION OF NEC WITH APPROVED STAINLESS STEEL CONDUIT CLAMPS, HANGER RODS AND STRUCTURAL FASTENERS.
- B. ALL RACEWAY RUNS, WHETHER TERMINATED IN BOXES OR NOT, SHALL BE CAPPED DURING THE COURSE OF CONSTRUCTION AND UNTIL WIRES ARE PULLED IN, AND COVERS ARE IN PLACE. NO CONDUCTORS SHALL BE PULLED INTO RACEWAYS UNTIL CONSTRUCTION WORK WHICH MIGHT DAMAGE THE RACEWAYS HAS BEEN COMPLETED.
- C. ALL RACEWAYS SHALL HAVE AN INSULATED COPPER SYSTEM GROUND CONDUCTOR THROUGHOUT THE ENTIRE LENGTH OF CIRCUIT INSTALLED WITHIN CONDUIT IN STRICT ACCORDANCE WITH NEC. GROUNDING CONDUCTOR SHALL BE INCLUDED IN TOTAL CONDUIT FILL DETERMINING CONDUIT SIZE EVEN THOUGH NOT INCLUDED OR SHOWN ON DRAWINGS. GROUNDING CONDUCTORS RUN WITH FEEDERS SHALL BE BONDED TO PORTIONS OF CONDUIT THAT ARE METAL BY APPROVED GROUND BUSHINGS.
- D. RACEWAYS WHICH DO NOT HAVE CONDUCTORS FURNISHED UNDER THIS DIVISION OF THE SPECIFICATIONS SHALL BE LEFT WITH AN APPROVED NYLON PULL CORD IN RACEWAY.

#### END OF SECTION

#### SECTION 26 05 19

#### WIRES AND CABLES

PART 1 - GENERAL

- 1.01 GENERAL PROVISIONS
- A. THE CONTRACTOR SHALL PROVIDE WIRE AND CABLE, COMPLETE AND OPERABLE, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 1.02 SUBMITTALS
- A. SUBMIT MANUFACTURER'S DATA SHEETS ON ALL MAJOR TYPES OF WIRES AND CABLES INCLUDING SPLICING TAPE, AND TERMINATING/SPLICING LUGS OR CONNECTORS AND CABLE SLEEVES.

#### PART 2 - PRODUCTS

2.01 LOW VOLTAGE POWER AND LIGHTING WIRE

- A. WIRE RATED FOR 600 VOLTS IN DUCT OR CONDUIT FOR POWER AND LIGHTING CIRCUITS SHALL BE SINGLE CONDUCTOR, CLASS B TYPE XHHW OR XHHW-2 CROSS-LINKED POLYETHYLENE CONFORMIN TO UL-44 - UL STANDARD FOR THERMOSET-INSULATED WIRES AND CABLES. THHN/THWN WIRE SHA NOT BE PERMITTED TO BE USED FOR ANY POWER OR CONTROL WIRING IN THIS PROJECT EXCEPT WHERE SPECIFIED OTHERWISE.
- B. WIRING FOR 600 VOLT CLASS POWER AND LIGHTING SHALL BE AS MANUFACTURED BY OKONITE,



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SET r construction

|           |        | GENERAL CABLE, SOUTHWIRE, OR EQUAL.  |
|-----------|--------|--|
| NT        |        | LOW VOLTAGE CONTROL WIRE<br>LOW VOLTAGE CONTROL WIRE IN DUCT OR CONDUIT SHALL BE THE SAME TYPE AS POWER AND<br>LIGHTING WIRE INDICATED ABOVE.  |
|           | В.     | CONTROL WIRING SHALL BE NO.14 AWG, OR AS OTHERWISE SHOWN.  |
|           | C.     | CONTROL WIRES INSIDE PANELS AND CABINETS SHALL BE MACHINE TOOL GRADE TYPE MTW, UL<br>APPROVED, RATED FOR 90 DEGREES C AT DRY LOCATIONS, AND BE AS MANUFACTURED BY<br>AMERICAN, GENERAL CABLE, OR EQUAL.  |
|           | PART   | 3 - EXECUTION  |
|           |        | INSTALLATION<br>THE CONTRACTOR SHALL PROVIDE, TERMINATE AND TEST ALL POWER, CONTROL, AND<br>INSTRUMENTATION CONDUCTORS.  |
|           | В.     | THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE THE NUMBER OF CONTROL WIRES LISTED IN THE CONDUIT SCHEDULE OR ON THE CONTRACT DRAWINGS. EXCESS WIRES SHALL BE TREATED AS   |
|           | C.     | SPARES FOR FUTURE USE.<br>CONDUCTORS SHALL NOT BE PULLED INTO ANY RACEWAY UNTIL RACEWAY HAS BEEN CLEARED OF<br>MOISTURE AND DEBRIS.  |
|           | D.     | INSTRUMENTATION WIRE SHALL NOT BE RUN IN THE SAME RACEWAY WITH POWER AND CONTROL WIRING EXCEPT WHERE SPECIFICALLY INDICATED.   |
| IE        | E.     | WIRE IN PANELS, CABINETS, AND WIREWAYS SHALL BE NEATLY GROUPED USING NYLON TIE STRAPS,<br>AND SHALL BE NEATLY FANNED OUT TO TERMINALS.   |
|           |        | END OF SECTION   |
|           |        | SECTION 26 05 26   |
|           |        | SECONDARY GROUNDING  |
|           | PART   | 1 - GENERAL  |
|           | 1.01 V | NORK INCLUDED  |
|           | A.     | POWER SYSTEM GROUNDING.  |
|           | В.     | ELECTRICAL EQUIPMENT AND RACEWAY GROUNDING AND BONDING.  |
|           | 1.02   | SYSTEM DESCRIPTION   |
| JM,       | A.     | WHERE APPLICABLE, BOND TOGETHER SYSTEM NEUTRALS, SERVICE EQUIPMENT ENCLOSURES,<br>EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY<br>SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND<br>CONNECTORS, AND PLUMBING SYSTEMS. |
|           | PART   | 2 - PRODUCTS   |
|           | 2.01   | EQUIPMENT  |
|           | A.     | COMPONENTS OF THE GROUNDING ELECTRODE SYSTEM SHALL BE MANUFACTURED IN ACCORDANCE<br>WITH UL 467 - STANDARD FOR SAFETY GROUNDING AND BONDING EQUIPMENT, AND SHALL CONFORM<br>TO THE APPLICABLE REQUIREMENTS OF NATIONAL ELECTRICAL CODE ARTICLE 250 AND LOCAL<br>CODES.           |
| W         | В.     | GROUNDING SYSTEM   |
| ED        |        | 1. GROUNDING LOOP CONDUCTORS SHALL BE BARE ANNEALED COPPER CONDUCTORS.   |
|           |        | 2. GROUND RODS   |
|           |        | <ul> <li>a. UNLESS INDICATED OTHERWISE, PROVIDE GROUND RODS MINIMUM OF 3/4 INCH IN DIAMETER,<br/>10 FEET LONG, AND WITH A UNIFORM COVERING OF ELECTROLYTIC COPPER METALLICALLY<br/>BONDED TO A RIGID STEEL CORE.</li> </ul>  |
|           |        | b. PROVIDE CORROSION-RESISTANT COPPER-TO-STEEL BOND.   |
|           |        | c. THE RODS SHALL CONFORM TO UL 467.   |
|           |        | <ul> <li>d. THE RODS SHALL BE OF THE SECTIONAL TYPE, JOINED BY THREADED COPPER ALLOY<br/>COUPLINGS.</li> </ul>   |
| T<br>ZES, |        | <ol> <li>MAKE BURIED, CONCRETE-ENCASED, OR OTHERWISE INACCESSIBLE CABLE-TO-CABLE AND<br/>CABLE-TO-GROUND ROD CONNECTIONS USING EXOTHERMIC WELDS BY CADWELD, THERMOWELD,<br/>OR EQUAL.</li> </ol>   |
|           |        | 5. EXPOSED CONNECTORS  |
|           |        | a. EXPOSED GROUNDING CONNECTORS SHALL BE OF THE COMPRESSION TYPE<br>(CONNECTOR-TO-CABLE), CONSTRUCTED OF HIGH-COPPER ALLOY, AND MANUFACTURED<br>SPECIFICALLY FOR THE PARTICULAR GROUNDING APPLICATION.   |
|           |        | b. THE CONNECTORS SHALL BE BURNDY, O.Z. GEDNEY, OR EQUAL.  |
|           |        | 6. USE GROUNDING CLAMPS TO BOND EACH SEPARATELY-DERIVED SYSTEM TO THE GROUNDING ELECTRODE CONDUCTORS.  |
|           |        | 7. EQUIPMENT GROUNDING CIRCUIT CONDUCTORS  |
|           |        | a. THE CONDUCTORS SHALL BE THE SAME TYPE AND INSULATION AS THE LOAD CIRCUIT CONDUCTORS.  |
| Ξ         |        | b. THE MINIMUM SIZE SHALL BE AS INDICATED. WHERE NOT INDICATED, SIZES SHALL CONFORM<br>TO TABLE 250.122 OF THE NATIONAL ELECTRICAL CODE.   |
| ì         |        | c. METALLIC CONDUIT SYSTEMS SHALL HAVE AN EQUIPMENT GROUNDING WIRES AS WELL AS<br>BEING EQUIPMENT GROUNDING CONDUCTORS THEMSELVES.   |
|           |        | 8. GROUNDING MATERIALS MANUFACTURER, OR EQUAL  |
|           |        |  |
|           |        |  |
| NG<br>ALL |        | c. BURNDY<br>d. THOMAS AND BETTS   |
|           |        | e. OZ GEDNEY   |
|           | PART   | 3 - EXECUTION  |

| RE PARK             |            |             |                          | Title<br>ELECTRICAL SPECIFICATIONS |             |            |    |    |               |   |
|---------------------|------------|-------------|--------------------------|------------------------------------|-------------|------------|----|----|---------------|---|
| S LIGHTING UPGRADES |            |             | Project No.<br>215618048 | Scale<br>NO SCALE                  |             |            |    | _  |               |   |
| WG                  | DS<br>Dwn. | BB<br>Chkd. | NE<br>Dsgn.              | 22.09.27<br>YY.MM.DD               | Drawing No. | Sheet<br>3 | of | 19 | Revision<br>0 | _ |

| 3.01 INSTALLATION  | INTERRUPTING 5,000 AMPERE   |
|--|---|
| A. PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EACH FEEDER AND BRANCH<br>CIRCUIT. TERMINATE EACH END ON A GROUNDING LUG, BUS, OR BUSHING.  | 4. GFCIS SHALL BE WEATHER RE  |
| B. CONNECT GROUNDING ELECTRODE CONDUCTORS TO METAL WATER PIPE USING AN APPROVED  | 5. FEED-THROUGH-TYPE GFCIS  |
| C. ALL GROUND CONNECTIONS AT GROUND RODS, BUILDING STEEL, AND CONCRETE REINFORCING   | a. LEVITON: G5362-WT<br>b. HUBBEL: GFR5362SG  |
| STEEL SHALL BE EXOTHERMIC WELD TYPE.   | c. OR EQUAL   |
| 3.02 FIELD QUALITY CONTROL   | 2.04 ENCLOSURES AND COVERS  |
| A. INSPECT GROUNDING AND BONDING SYSTEM CONDUCTORS AND CONNECTIONS FOR RIGHTNESS<br>AND PROPER INSTALLATION.   | E. SURFACE-MOUNTED SWITCHES   |
| B. PERFORM FALL-OF-POTENTIAL GROUND RESISTANCE TEST. RESISTANCE OF LESS THAN 25 OHMS<br>WILL NOT BE ACCEPTED AND REQUIRE AN ADDITIONAL GROUNDING ELECTRODE. SUBMIT GROUND<br>RESISTANCE TEST TO THE ENGINEER.                      | WEATHERPROOF CONDUIT FITTI<br>F. SWITCH AND RECEPTACLE COVE                               |
| END OF SECTION   | DIE-CAST COPPER-FREE ALUMIN 1. APPLETON: FSK  |
|  | 2. CROUSE-HINDS: DS185 AND W  |
| SECTION 26 05 36<br>WIRING DEVICES   | 3. HUBBELL KILLARK: FZ AND FC   |
| PART 1 GENERAL   | 4. OR EQUAL   |
| 1.1 THE SUMMARY  | C. IN FINISHED AREAS, SWITCH ANE<br>STEEL.  |
| A. THE CONTRACTOR SHALL PROVIDE WIRING DEVICES, COMPLETE AND OPERABLE, AS INDICATED IN   | D. WET LOCATIONS  |
| ACCORDANCE WITH THE CONTRACT DOCUMENTS.<br>B. SINGLE MANUFACTURER  | 1. RECEPTACLES IN WET LOCAT<br>COVER/ENCLOSURE MARKED                                     |
| <ol> <li>LIKE PRODUCTS SHALL BE THE END PRODUCT OF ONE MANUFACTURER IN ORDER TO ACHIEVE<br/>STANDARDIZATION OF APPEARANCE, OPERATION, MAINTENANCE, SPARE PARTS, AND<br/>MANUFACTURER'S SERVICES.</li> </ol>                        | <ol> <li>PROVIDE A GASKET BETWEEN<br/>HINGED COVER AND MOUNTIN<br/>a. APPLETON</li> </ol> |
| 1.2 CONTRACTOR SUBMITTALS  | b. CROUSE-HINDS   |
| A. SHOP DRAWINGS   | c. HUBBELL  |
| 1. SUBMIT COMPLETE CATALOG CUTS OF SWITCHES, RECEPTACLES, ENCLOSURES, COVERS AND   | d. OR EQUAL   |
| APPURTENANCES, MARKED TO CLEARLY IDENTIFY THE PROPOSED MATERIALS.  | PART 3 - EXECUTION  |
| <ol> <li>SUBMIT DOCUMENTATION SHOWING THAT THE PROPOSED MATERIALS COMPLY WITH THE<br/>REQUIREMENTS OF NEC AND U.L.</li> </ol>  | 3.1 GENERAL   |
| 3. SUBMIT DOCUMENTATION OF THE MANUFACTURER'S QUALIFICATIONS.  | A. PERFORM WORK IN ACCORDANC  |
| PART 2 PRODUCTS  | 3.2 CONNECTION  |
| 2.01 GENERAL   | A. RIGIDLY ATTACH WIRING DEVICE   |
| A. DEVICES SHALL CARRY THE U.L. LABEL, AND SHALL BE DESIGNED FOR USE WITH STRANDED COPPER CONDUCTORS.  | INTERFERENCE WITH OTHER EQ 3.3 GROUNDING  |
| B. COLOR   | A. DEVICES, INCLUDING SWITCHES<br>NEC, ARTICLE 250.                                       |
| <ol> <li>GENERAL PURPOSE DUPLEX RECEPTACLES AND TOGGLE SWITCH HANDLES SHALL BE WHITE OR<br/>GRAY EVERYWHERE EXCEPT UNLESS OTHERWISE INDICATED.</li> </ol>  | B. SWITCHES AND ASSOCIATED ME   |
| <ol> <li>RECEPTACLES AND SWITCHES SHALL BE OF SPECIFICATION GRADE AND SHALL CONFORM TO<br/>NEMA WD-1, FEDERAL SPECIFICATIONS W-C-596E AND W-S-896E, RESPECTIVELY.</li> </ol>   | YOKE, OUTLET BOX, AND RACEW   |
| 2.02 LIGHTING SWITCHES   | 1. FLUSH RECEPTACLES AND TH   |
| A. TOGGLE SWITCHES SHALL BE AC ONLY TYPE SWITCH.   | GROUND CONNECTIONS TO T   |
| 1. 20A, 120/277V, SINGLE, DOUBLE, 3-WAY AND 4-WAY, RESPECTIVELY  | 2. MAINTAIN THE GROUND TO EA<br>THE MOUNTING SCREW, OR B                                  |
| a. LEVITON: 1221-2, 1222-2, 1223-2, 1224-2   | THE OUTLET BOX AND GROUN  |
| b. HUBBELL: HBL1221, HBL1222, HBL1223, HBL1224   | D. RECEPTACLES SERVED FROM AN<br>ISOLATED GROUNDING CONDUC                                |
| c. PASS AND SEYMOUR: PS20AC1, PS20AC2, PS20AC3, PS20AC4  | 3.4 FIELD TESTING   |
| d. OR EQUAL  | A. TEST EACH RECEPTACLE FOR PO  |
| 2.03 GENERAL PURPOSE RECEPTACLES   |   |
| A. DUPLEX RECEPTACLES SHALL BE OF THE POLARIZED 3-WIRE TYPE FOR USE WITH A 3-WIRE CORD<br>WITH GROUNDED LEAD, AND ONE DESIGNATED STUD SHALL BE PERMANENTLY GROUNDED TO THE<br>CONDUIT SYSTEM IN ACCORDANCE WITH NEC ARTICLE 406.4. | B. TEST OPERATION OF GFCI PROT  |
| B. DRY AREAS   |   |
| 2. NEMA CONFIGURATION #5-20R: DUPLEX RECEPTACLE RATED 125V, 20A  |   |
| a. LEVITON: #5362  | PART 1 - GENERAL  |
| b. HUBBELL: #HBL5362   | 1.01 WORK INCLUDED  |
| c. PASS AND SEYMOUR: #5362A  | A. FURNISH AND INSTALL NEW PAN  |
| d. OR EQUAL<br>2. NEMA CONFIGURATION #5-30R SINGLE RECEPTACLE RATED 125V, 30A  | B. MODIFICATIONS TO EXISTING PC   |
| a. LEVITON: #5371  | 1.02 SUBMITTALS   |
| b. HUBBELL: #HBL9308   | A. SUBMIT SHOP DRAWINGS FOR E   |
| c. OR EQUAL  | B. INCLUDE OUTLINE AND SUPPORT  |
| C. DAMP/WET AREAS  | SHORT CIRCUIT AMPERE RATING<br>SIZES.   |
| 1. RECEPTACLES FOR DAMP/WET LOCATIONS SHALL BE WEATHER-RESISTANT WITH EXTRA DUTY,  | C. SINGLE MANUFACTURER: LIKE P  |
| IN-USE LISTED COVERS IN ACCORDANCE WITH NEC ARTICLE 406.8.   | ORDER TO ACHIEVE STANDARDIZ<br>AND MANUFACTURER'S SERVICE                                 |
|  | PART 2 - PRODUCTS   |
| <ol> <li>GROUND-FAULT CIRCUIT-INTERRUPTING RECEPTACLES (GFCIS) SHALL BE INSTALLED AT THE<br/>INDICATED LOCATIONS AND AS REQUIRED BY THE NEC.</li> </ol>  | 2.01 PANELBOARDS  |
| 2. GFCIS SHALL BE DUPLEX RECEPTACLES, OF SPECIFICATION GRADE, AND TRIPPING AT 5 MA.  | A. RATINGS  |
| 3. GFCI RATINGS SHALL BE 125V, 20 AMPERES, NEMA WD-1, CONFIGURATION 5-20R, AND CAPABLE OF  | 1. PANELBOARDS RATED 240 VA   |
|  |   |
|  |   |

By Appd. YY.MM.DD

ORIGINAL SHEET – ANSI D HORIZ

Revision

- RRUPTING 5,000 AMPERES WITHOUT DAMAGE.
- IS SHALL BE WEATHER RESISTANT-LISTED IN ACCORDANCE WITH NEC ARTICLE 406.8. D-THROUGH-TYPE GFCIS SERVING STANDARD RECEPTACLES WILL NOT BE PERMITTED.
- CE-MOUNTED SWITCHES AND RECEPTACLES SHALL BE HOUSED IN FS OR FD-TYPE
- IERPROOF CONDUIT FITTINGS. H AND RECEPTACLE COVERS ON SURFACE-MOUNTED BOXES SHALL BE CONSTRUCTED OF
- ST COPPER-FREE ALUMINUM.
- USE-HINDS: DS185 AND WLRD-1
- SHED AREAS, SWITCH AND RECEPTACLE COVERS SHALL BE CONSTRUCTED OF STAINLESS
- EPTACLES IN WET LOCATIONS SHALL BE PROVIDED WITH A HINGED METALLIC 'ER/ENCLOSURE MARKED "SUITABLE FOR WET LOCATIONS WHEN IN USE" AND "UL LISTED." VIDE A GASKET BETWEEN THE ENCLOSURE AND THE MOUNTING SURFACE, AND BETWEEN THE GED COVER AND MOUNTING PLATE/BASE.
- RM WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEC.
- Y ATTACH WIRING DEVICES IN ACCORDANCE WITH THE NEC AND AS INDICATED, AVOIDING ERENCE WITH OTHER EQUIPMENT.
- ES, INCLUDING SWITCHES AND RECEPTACLES, SHALL BE GROUNDED IN ACCORDANCE WITH
- HES AND ASSOCIATED METAL PLATES SHALL BE GROUNDED THROUGH THE SWITCH MOUNTING OUTLET BOX, AND RACEWAY SYSTEM.
- SH RECEPTACLES AND THEIR METAL PLATES SHALL BE GROUNDED THROUGH POSITIVE OUND CONNECTIONS TO THE OUTLET BOX AND GROUNDING SYSTEM.
- NTAIN THE GROUND TO EACH RECEPTACLE BY A SPRING-LOADED GROUNDING CONTACT TO MOUNTING SCREW, OR BY A GROUNDING JUMPER, EACH MAKING A POSITIVE CONNECTION TO OUTLET BOX AND GROUNDING SYSTEM AT ALL TIMES.
- TACLES SERVED FROM AN UNINTERRUPTIBLE POWER SUPPLY SHALL BE PROVIDED WITH AN ED GROUNDING CONDUCTOR FROM THE SERVING POWER PANELBOARD.
- ACH RECEPTACLE FOR POLARITY AND GROUND INTEGRITY, USING A STANDARD RECEPTACLE
- PERATION OF GFCI PROTECTION WHERE APPLICABLE.
  - END OF SECTION
  - SECTION 26 12 16
  - PANELBOARDS
- 3H AND INSTALL NEW PANELBOARDS AND BRANCH CIRCUITS AS SHOWN ON THE DRAWINGS. ICATIONS TO EXISTING POWER DISTRIBUTION PANELS, WHERE SHOWN ON DRAWINGS.
- SHOP DRAWINGS FOR EQUIPMENT AND COMPONENT DEVICES.
- DE OUTLINE AND SUPPORT POINT DIMENSIONS, VOLTAGE, MAIN BUS AMPACITY, INTEGRATED CIRCUIT AMPERE RATING, CIRCUIT BREAKER AND FUSIBLE SWITCH ARRANGEMENT AND
- E MANUFACTURER: LIKE PRODUCTS SHALL BE THE END PRODUCT OF ONE MANUFACTURER IN TO ACHIEVE STANDARDIZATION OF APPEARANCE, OPERATION, MAINTENANCE, SPARE PARTS, ANUFACTURER'S SERVICES.

- 10,000 AMPERES RMS SYMMETRICAL OR AS INDICATED BY A SHORT CIRCUIT STUDY, OR DRAWINGS, WHICHEVER IS GREATER.
- 2. PANELBOARDS RATED 480 VAC SHALL HAVE SHORT CIRCUIT RATINGS NOT LESS THAN 65,000 AMPERES RMS SYMMETRICAL OR AS INDICATED BY THE PROTECTIVE DEVICE STUDY, WHICHEV IS GREATER.
- 3. PANELBOARDS SHALL BE LABELED WITH A UL SHORT CIRCUIT RATING. SERIES RATINGS ARE NO ACCEPTABLE.
- **B. CONSTRUCTION**
- 1. LIGHTING AND POWER DISTRIBUTION PANELS SHALL HAVE TIN-PLATED COPPER BUS BARS.
- 2. BREAKERS SHALL BE ONE, 2, OR 3 POLE AS INDICATED, WITH AMPERE TRIP RATINGS AS REQUIR BY THE EQUIPMENT. BREAKERS SHALL BE QUICK-MAKE AND QUICK-BREAK, INVERSE TIME TRIP CHARACTERISTICS, TO TRIP FREE ON OVERLOAD OR SHORT CIRCUIT, AND TO INDICATE TRIP CONDITION BY THE HANDLE POSITION.
- 3. THE PANELS SHALL HAVE HINGED DOORS WITH COMBINATION CATCH AND LATCH. THE FRONT PANELS SHALL BE SO ARRANGED THAT WHEN THE PLATES ARE REMOVED, THE GUTTERS, TERMINALS AND WIRING WILL BE EXPOSED AND ACCESSIBLE. THE DOORS SHALL HAVE INNER DOORS WITHIN THE PLATES TO HAVE ONLY THE BREAKER OPERATING MECHANISM EXPOSED WHEN THEY ARE OPENED. LIVE CONDUCTORS AND TERMINALS SHALL BE CONCEALED BEHIND THE PLATES.
- 4. PANELBOARDS SHALL BE RATED FOR THE INTENDED VOLTAGE.
- 5. CIRCUIT BREAKERS SHALL BE INTERCHANGEABLE AND CAPABLE OF BEING OPERATED IN ANY POSITION AS WELL AS BEING REMOVABLE FROM THE FRONT OF THE PANELBOARD WITHOUT DISTURBING ADJACENT UNITS. NO PLUG-IN CIRCUIT BREAKERS WILL BE ACCEPTABLE.
- 6. PANELS SHALL HAVE THE NECESSARY BARRIERS, SUPPORTS, AND LIBERAL WIRING GUTTERS. TRIM SCREWS SHALL BE STAINLESS STEEL. PANELBOARD PARTS OF METAL OTHER THAN COPI ALUMINUM, OR STAINLESS STEEL SHALL BE CADMIUM PLATED.
- 7. PANELBOARDS SHALL BE UL LISTED EXCEPT FOR SPECIAL ENCLOSURES WHICH ARE NOT AVAILABLE WITH UL LISTING.
- 8. PANELBOARDS SHALL BE SUITABLE FOR USE AS SERVICE ENTRANCE WHERE INDICATED.
- 9. PANELBOARDS LOCATED OUTDOORS SHALL HAVE A NEMA 4X STAINLESS STEEL ENCLOSURE.
- C. MANUFACTURERS: GENERAL ELECTRIC, EATON, SCHNEIDER ELECTRIC/SQUARE D COMPANY, OR EQUAL
- D. SURGE PROTECTION DEVICES (SPD)
- 1. PROVIDE INTEGRAL SPDS.
- 2. SPD UNITS SHALL BE RATED FOR THE VOLTAGE AND PHASE SERVICE OF THE PANEL AT 240 KA PHASE.
- 2.02 CIRCUIT BREAKERS
- A. ALL BREAKERS AND ACCESSORIES SHALL BE FULLY RATED WITH MINIMUM INTEGRATED SHORT CIRCUIT RATING EQUAL TO THE SHORT CIRCUIT RATING OF THE THE EXISTING PANEL.
- B. MOLDED CASE CIRCUIT BREAKERS SHALL MATCH EXISTING THERMAL/MAGNETIC TRIP CIRCUIT BREAKERS, WITH COMMON TRIP HANDLE FOR ALL POLES. PROVIDE CIRCUIT BREAKERS UL LISTED BREAKERS SHALL HAVE SHUNT TRIP OPTION FOR CONNECTION TO THE GROUND FAULT MONITOR
- PART 3 EXECUTION
- 3.01 INSTALLATION
- C. MAXIMUM HEIGHT: 6 FT. TO TOP.
- D. PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.
- E. PROVIDE TYPED CIRCUIT DIRECTORY FOR EACH BRANCH CIRCUIT PANELBOARD. REVISE DIRECTOR TO REFLECT CIRCUITING CHANGES REQUIRED TO BALANCE PHASE LOADS. ALL REVISIONS SHALL TYPED. HANDWRITING WILL NOT BE ACCEPTED.
- F. PROVIDE ENGRAVED LABELS WITH PANEL DESIGNATIONS AS SHOWN ON DRAWINGS. LABELS SHAL BE SECURELY FASTENED TO THE PANEL.
- 3.02 FIELD QUALITY CONTROL
- A. VISUAL AND MECHANICAL INSPECTION: INSPECT FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND GROUNDING. CHECK PROPER INSTALLATION AND TIGHTNESS OF CONNECTION FOR CIRCUIT BREAKERS

END OF SECTION

26 12 19

- PART 1 GENERAL
- 1.01 THE SUMMARY
- A. THE CONTRACTOR SHALL PROVIDE THE SECONDARY UNIT SUBSTATION TRANSFORMERS, COMPLE AND OPERABLE, AS INDICATED AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- B. PROVIDED EQUIPMENT SHALL BE NEW.
- C. THE MANUFACTURER OF THE SECONDARY UNIT SUBSTATION TRANSFORMER SHALL FURNISH AND COORDINATE THE MAJOR COMPONENTS OF THE SUBSTATIONS, SUCH AS INCOMING LINE SECTION TRANSFORMER, AND LOW VOLTAGE SECTION.
- D. THE SECONDARY UNIT SUBSTATION(S) SHALL BE MANUFACTURED BY EATON ELECTRICAL, GENERA ELECTRIC, SQUARE D, OR EQUAL.
- E. THE SECONDARY UNIT SUBSTATION TRANSFORMERS SHALL BE DESIGNED, ASSEMBLED, AND TEST IN ACCORDANCE WITH THE LATEST APPLICABLE STANDARDS OF NEMA, I.E.E.E. AND ANSI, APPLICA TO ITS 3 MAJOR SECTIONS.

PART 2 - PRODUCTS

- 2.01 MINI UNIT SUBSTATIONS
- A. MINI UNIT SUBSTATIONS SHALL BE SINGLE-UNIT CONSTRUCTION CONSISTING OF A PRIMARY AND SECONDARY CIRCUIT BREAKER PROTECTION, DRY-TYPE TRANSFORMER, AND PANELBOARD WITH

ELBOARDS RATED 240 VAC OR LESS SHALL HAVE SHORT CIRCUIT RATINGS NOT LESS THAN





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MINI UNIT SUBSTATIONS

|             |      | BREAKERS AND RATINGS AS SHOWN ON THE DESIGN DRAWINGS.   |
|-------------|------|---|
|             | В.   | THE ENCLOSURE SHALL BE NEMA 4X OR 3R STAINLESS STEEL WHERE MOUNTED OUTDOORS AND NEMA 1, PAINTED STEEL WHERE MOUNTED INDOORS IN CONDITIONED AREAS.   |
| ′ER<br>OT   | C.   | TRANSFORMERS SHALL BE STANDARD DRY-TYPE TRANSFORMERS AND MEET THE ENERGY<br>EFFICIENCY REQUIREMENTS OF THE DEPARTMENT OF ENERGY CODE OF FEDERAL REGULATIONS (10<br>CFR PART 431), DOE 2016 EFFICIENCY LEVELS. RATINGS AND VOLTAGES AS INDICATED ON THE  |
|             | D.   | DESIGN DRAWINGS.<br>REFER TO SECTION 26 12 16 - PANELBOARDS, FOR ADDITIONAL REQUIREMENTS FOR THE  |
|             | -    | PANELBOARD SECTION.   |
| RED         |      | MANUFACTURER SHALL BE EATON, SQUARE D, OR EQUAL.  |
|             |      | 3 - EXECUTION   |
|             |      | ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED SECURELY IN PLACE. EQUIPMENT SHALL BE<br>MOUNTED PARALLEL AND PERPENDICULAR TO THE WALLS, FLOORS, AND CEILINGS.   |
|             | В.   | ALL ANCHORS AND FASTENERS SHALL BE TYPES DESIGNED FOR THE INTENDED PURPOSE AND SHALL<br>BE CAPABLE OF ADEQUATELY, SAFELY, AND PERMANENTLY SECURING THE MATERIAL IN PLACE.<br>GENERALLY, SCREWS SHALL BE USED ON WOOD SURFACES, MASONRY ANCHORS IN CONCRETE OR<br>BRICK, TOGGLE BOLTS ON HOLLOW WALLS, MACHINE SCREWS, BOLTS, OR WELDED STUDS ON STEEL.<br>NAILS SHALL BE USED ONLY FOR TEMPORARY ATTACHMENT OR SUPPORT. |
|             | C.   | OMISSIONS OR CONFLICTS ON DRAWINGS OR BETWEEN DRAWINGS AND SPECIFICATIONS SHALL BE<br>BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH<br>THE WORK.  |
|             |      | END OF SECTION  |
| PER,        |      |   |
|             |      | SECTION 26 36 10  |
|             |      | GENERATOR DOCKING STATION   |
|             | PART | 1 GENERAL   |
|             | 1.1. | GENERAL   |
|             | 1.2. | QUALITY ASSURANCE   |
|             | A.   | ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.   |
| PER         | В.   | ETL/UL LISTED TO 1008 STANDARDS   |
|             |      | UL 50 LISTED  |
|             |      | COORDINATION  |
| ).          | A.   | COORDINATE LAYOUT AND INSTALLATION OF GENERATOR DOCKING STATION, AND COMPONENTS<br>WITH EQUIPMENT SERVED AND ADJACENT SURFACES. MAINTAIN REQUIRED WORKSPACE<br>CLEARANCES AND REQUIRED CLEARANCES FOR EQUIPMENT ACCESS DOORS AND PANELS   |
|             | 1.1. | GUARANTEE/WARRANTY  |
|             | A.   | MANUFACTURER WARRANTY SHALL BE PROVIDED FOR A MINIMUM OF 1 YEAR,  |
|             | В.   | THE EQUIPMENT INSTALLED UNDER THIS CONTRACT SHALL BE LEFT IN PROPER WORKING ORDER   |
|             | C.   | NEW MATERIALS AND EQUIPMENT SHALL BE GUARANTEED AGAINST DEFECTS IN COMPOSITION, DESIGN OR WORKMANSHIP. GUARANTEE CERTIFICATES SHALL BE FURNISHED.   |
| DRY<br>BE   | PART | 2 PRODUCTS  |
|             | 1.1. | DOCKING STATION   |
| LL          | A.   | MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING OR APPROVED EQUAL. SEE DRAWINGS FOR CONFIGURATION.  |
|             | 2.1. | GENERAL REQUIREMENTS  |
| IS          | A.   | ENCLOSURE   |
|             |      | 1. NEMA 3R RAIN-TIGHT ALUMINUM ENCLOSURE  |
|             |      | i. PAD-LOCKABLE FRONT DOOR SHALL INCLUDE A HINGED ACCESS PLATE AT THE BOTTOM FOR<br>ENTRY OF TEMPORARY CABLING THAT PREVENTS UNAUTHORIZED TAMPERING WHILE IN USE.   |
|             |      | ii. NEMA 3R INTEGRITY SHALL BE MAINTAINED WHILE TEMPORARY CABLING IS CONNECTED<br>DURING USE  |
|             |      | iii. FRONT AND SIDE SHALL BE ACCESSIBLE FOR MAINTENANCE   |
|             |      | iv. TOP, SIDE, AND BOTTOM SHALL BE ACCESSIBLE FOR PERMANENT CABLING   |
| ETE         |      | <ol> <li>POWDER COAT</li> <li>PAINT AFTER FABRICATION SHALL BE HAMMER TONE GRAY OR AS SELECTED BY THE OWNER.</li> </ol>   |
|             | В.   | PHASE, NEUTRAL, AND GROUND BUSBAR   |
| _           |      | 1. MATERIAL: SILVER-PLATED COPPER   |
| )<br>N,     |      | 2. EQUIPMENT GROUND BUS: BONDED TO BOX.   |
|             |      | 3. ISOLATED GROUND BUS: INSULATED FROM BOX.   |
| AL          |      | 4. GROUND BUS: 50% OF PHASE SIZE.   |
| TED<br>\BLE |      | 5. NEUTRAL BUS: NEUTRAL BUS RATED 100 PERCENT OF PHASE BUS.   |
| ULC         | C.   | TEMPORARY GENERATOR CONNECTORS SHALL BE CAMLOK STYLE MOUNTED ON GLAND PLATE. 1. CAMLOK SHALL BE 16 SERIES MODEL AND COLOR CODED ACCORDING TO SYSTEM VOLTAGE   |
|             |      | REQUIREMENTS.<br>2. CAMLOK CONNECTIONS SHALL BE BUS BAR STYLE, CABLING OR DOUBLE SET SCREW IS NOT<br>ACCEPTABLE   |
|             |      | ACCEPTABLE 3. CAMLOK CONNECTION SHALL BE PROTECTED AGAINST ACCIDENTAL CONTACT WHILE NOT IN USE  |
|             |      | U. CAMEOR CONNECTION SHALL BE PROTECTED AGAINST ACCIDENTAL CONTACT WHILE NOT IN USE   |
|             |      |   |

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| LIGHTING UPGRADES   |                            |  |           | Project No.               | Scale       |       |  |  | —        |   |
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| D. | PERMANENT CONNECTION SHALL BE FACTORY INSTALLED BROAD RANGE SET-SCREW MECHANICAL |
|----|--|
|    | TYPE, LOCATED BEHIND A PHYSICAL BARRIER  |
|    |  |

- E. SHORT CIRCUIT & WITHSTAND RATING
- 1. SHALL BE MINIMUM 65 KAIC UNLESS OTHERWISE INDICATED ON DRAWINGS
- F. VOLTAGE & AMPERAGE
- 1. SEE DRAWINGS
- G. FACTORY INSTALLED PHASE ROTATION MONITOR DEVICE:
- 1. PHASE MONITORING RELAY TO BE SIEMENS 3U4512-1AR20 OR EQUAL AND FACTORY INSTALLED
- H. BREAKER DISCONNECTS AS INDICATED ON PROJECT DRAWINGS AND MANUFACTURER SUBMITTAL
- 1. MUST BE UL 489 LISTED BREAKER
- 2. BREAKERS SHALL BE REMOVABLE FOR SERVICE AND MAINTENANCE
- PART 3 EXECUTION

DRAWINGS:

- 2.1. EXAMINATION
- A. EXAMINE ELEMENTS AND SURFACES TO RECEIVE GENERATOR DOCKING STATION FOR COMPLIANCE WITH INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING PERFORMANCE OF THE WORK.
- B. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED
- 3.1. INSTALLATION
- A. SURFACE, FLUSH OR BASE MOUNTED: DETERMINED BY APPLICATION
- 1. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO GENERATOR DOCKING STATION.
- 3.1. IDENTIFICATION
- A. IDENTIFY FIELD-INSTALLED CONDUCTORS, INTERCONNECTING WIRING, AND COMPONENTS; PROVIDE WARNING SIGNS.
- B. LABEL EACH ENCLOSURE WITH ENGRAVED METAL OR LAMINATED-PLASTIC NAMEPLATE.
- 3.1. FACTORY COMMISSIONING
- A. UPON COMPLETION OF THE INSTALLATION, THE DOCKING STATION SHALL BE COMMISSIONED BY THE MANUFACTURER'S FACTORY AUTHORIZED TECHNICIAN. THIS SERVICE IS PROVIDED AT AN ADDITIONAL COST.
- B. SCOPE OF WORK SHALL INCLUDE:
- 1. REVIEW AND VERIFY THE INSTALLATION OF ALL TRYSTAR COMPONENTS AND VERIFY THE CORRECT ELECTRICAL FLOW AS DEPICTED ON THE ONE-LINE DRAWINGS.
- 2. FACTORY TRAINING FOR ON-SITE PERSONNEL TO EDUCATE THEM ON HOW TO CONNECT THE GDS TO A PORTABLE GENERATOR
- 3. THE MANUFACTURER'S FACTORY AUTHORIZED TECHNICIAN SHALL, UPON COMPLETION OF THE COMMISSIONING PROVIDE A WRITTEN REPORT TO THE ELECTRICAL CONTRACTOR AND ELECTRICAL ENGINEER INDICATING THE COMPLETION OF THE WORK.
- 4. ANY ISSUE THAT IS FOUND DURING THE START-UP THAT IS DETERMINED AT THAT TIME TO BE A WARRANTY ISSUE WILL BE COVERED BY MANUFACTURER. ANY ISSUES THAT ARE SPECIFIC TO THE SCOPE FOR THE ELECTRICAL INSTALLING CONTRACTOR ARE THE SOLE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.
- 5. UPON SUCCESSFUL COMPLETION OF THE COMMISSIONING, TRYSTAR WILL PROVIDE A COMPLIMENTARY 12-MONTH WARRANTY EXTENSION, ABOVE AND BEYOND THE 12-MONTH MANUFACTURER WARRANTY.
- 3.1. FIELD QUALITY CONTROL
- A. THIRD PARTY TESTS AND INSPECTIONS TO INCLUDE THE FOLLOWING:
- 1. PERFORM EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST PARAMETERS.
- B. PREPARE TEST AND INSPECTION REPORTS, INCLUDING A CERTIFIED REPORT THAT IDENTIFIES GENERATOR DOCKING STATION AND THAT DESCRIBES SCANNING RESULTS. INCLUDE NOTATION

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| t/Project<br>BEL AIRE PARK                              |            |             |             | Title<br>ELECTRICAL SPECIFICATIONS |                          |            |    |    |               |
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| SPORTS LIGHTING UPGRADES<br>TOWN OF CUTLER BAY, FLORIDA |            |             |             | Project No.<br>215618048           | Scale<br>NO S            | SCALE      |    |    |               |
| ame: E—002.DWG  | DS<br>Dwn. | BB<br>Chkd. | NE<br>Dsgn. | 22.09.27<br>YY.MM.DD               | Drawing No. <b>E-004</b> | Sheet<br>5 | of | 19 | Revision<br>0 |

#### SECTION 26 55 68 EXTERIOR ATHLETIC LIGHTING

PART 1 - GENERAL

#### 1.1 SUMMARY

A. WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS SHALL CONFORM TO THE CONTRACT DOCUMENTS, ENGINEERING PLANS AS WELL AS STATE AND LOCAL CODES.

B. THE PURPOSE OF THESE SPECIFICATIONS IS TO DEFINE THE LIGHTING SYSTEM PERFORMANCE AND DESIGN STANDARDS FOR BEL AIRE PARK USING AN LED LIGHTING SOURCE. THE MANUFACTURER / CONTRACTOR SHALL SUPPLY LIGHTING EQUIPMENT TO MEET OR EXCEED THE STANDARDS SET FORTH IN THESE SPECIFICATIONS.

- C. THE SPORTS LIGHTING WILL BE FOR THE FOLLOWING VENUES:
- 1. FOOTBALL FIELD 450' BY 230'
- D. THE PRIMARY GOALS OF THIS SPORTS LIGHTING PROJECT ARE:
- 1. GUARANTEED LIGHT LEVELS: SELECTION OF APPROPRIATE LIGHT LEVELS IMPACT THE SAFETY OF THE PLAYERS AND THE ENJOYMENT OF SPECTATORS. THEREFORE LIGHT LEVELS ARE GUARANTEED TO NOT DROP BELOW SPECIFIED TARGET VALUES FOR A PERIOD OF 10 YEARS.
- 2. ENVIRONMENTAL LIGHT CONTROL: IT IS THE PRIMARY GOAL OF THIS PROJECT TO MINIMIZE SPILL LIGHT TO ADJOINING PROPERTIES AND GLARE TO THE PLAYERS, SPECTATORS AND NEIGHBORS.
- 3. COST OF OWNERSHIP: IN ORDER TO REDUCE THE OPERATING BUDGET, THE PREFERRED LIGHTING SYSTEM SHALL BE ENERGY EFFICIENT AND COST EFFECTIVE TO OPERATE. ALL MAINTENANCE COSTS SHALL BE ELIMINATED FOR THE DURATION OF THE WARRANTY.
- 4. CONTROL AND MONITORING: TO ALLOW FOR OPTIMIZED USE OF LABOR RESOURCES AND AVOID UNNEEDED OPERATION OF THE FACILITY, CUSTOMER REQUIRES A REMOTE ON/OFF CONTROL SYSTEM FOR THE LIGHTING SYSTEM. FIELDS SHOULD BE PROACTIVELY MONITORED TO DETECT LUMINAIRE OUTAGES OVER A 10-YEAR LIFE CYCLE. ALL COMMUNICATION AND MONITORING COSTS FOR 10-YEAR PERIOD SHALL BE INCLUDED IN THE BID.
- 1.2 LIGHTING PERFORMANCE

A. ILLUMINATION LEVELS AND DESIGN FACTORS: PLAYING SURFACES SHALL BE LIT TO AN AVERAGE TARGET ILLUMINATION LEVEL AND UNIFORMITY AS SPECIFIED IN THE CHART BELOW. LIGHTING CALCULATIONS SHALL BE DEVELOPED AND FIELD MEASUREMENTS TAKEN ON THE GRID SPACING WITH THE MINIMUM NUMBER OF GRID POINTS SPECIFIED BELOW. APPROPRIATE LIGHT LOSS FACTORS SHALL BE APPLIED AND SUBMITTED FOR THE BASIS OF DESIGN. AVERAGE ILLUMINATION LEVEL SHALL BE MEASURED IN ACCORDANCE WITH THE IESNA LM-5-04 (IESNA GUIDE FOR PHOTOMETRIC MEASUREMENTS OF AREA AND SPORTS LIGHTING INSTALLATIONS). ILLUMINATION LEVELS SHALL NOT TO DROP BELOW DESIRED TARGET VALUES IN ACCORDANCE TO IES RP-6-15, PAGE 2, MAINTAINED AVERAGE ILLUMINANCE AND SHALL BE GUARANTEED FOR THE FULL WARRANTY PERIOD.

| Area of Lighting | Average Target<br>Illumination<br>Levels | Maximum to<br>Minimum<br>Uniformity Ratio | Grid Points | Grid Spacing |
|------------------|--|---|-------------|--------------|
| Football Field   | 30 FC                                    | 2.5:1.0                                   | 128         | 30' x 30'    |

B. COLOR: THE LIGHTING SYSTEM SHALL HAVE A MINIMUM COLOR TEMPERATURE OF 5700K AND A CRI OF 75.

C. MOUNTING HEIGHTS: UTILIZE EXISTING POLES

| # of Poles | Pole Designation | Pole Height    |
|------------|------------------|----------------|
| 6          | P1 – P6          | Existing Poles |

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. LIGHT CONTROL LUMINAIRES: ALL LUMINAIRES SHALL UTILIZE SPILL LIGHT AND GLARE CONTROL DEVICES INCLUDING, BUT NOT LIMITED TO, INTERNAL SHIELDS, LOUVERS AND EXTERNAL SHIELDS. NO SYMMETRICAL BEAM PATTERNS ARE ACCEPTED
- LIGHTING DESIGNS SHALL ALSO MEET THE BEAM DISTRIBUTIONS STANDARDS SET FORTH BY THE IES RP-6-15 IN SECTION 5.4.1. BEAM TYPES FIGURE 14: NEMA SPORTS LIGHTING LUMINAIRE CLASSIFICATION.
- B. A TECHNICAL DOCUMENT ADDRESSING THE ISSUE OF LIGHTING IN THE VERTICAL PLANE ABOVE THE PLAYING SURFACE FOR AERIAL SPORTS WHILE ACHIEVING DESIRED GLARE CONTROL REQUIREMENTS WILL BE REQUIRED FOR APPROVAL.
- SPILL LIGHT AND GLARE CONTROL: TO MINIMIZE IMPACT ON ADJACENT PROPERTIES, SPILL LIGHT AND CANDELA VALUES MUST NOT EXCEED THE FOLLOWING LEVELS TAKEN AT 3 FEET ABOVE GRADE

| Bel Aire Park                           | Maximum |
|---|---------|
| 150' Off Field – Vertical Footcandles   | 0.3     |
| 150' Off Field – Horizontal Footcandles | 0.1     |
| 150' Off Field – Candela                | 7,000   |

IF A MANUFACTURER'S ENGINEERED LIGHTING SCAN INDICATES THAT THE ABOVE CRITERIA CANNOT BE MET, THEN AN INCREASE IN POLE MOUNTING HEIGHTS WOULD BE ACCEPTABLE PROVIDED THAT THESE SPECIFIED VALUES ARE ACHIEVED.

D. SPILL SCANS: SPILL SCANS MUST BE SUBMITTED INDICATING THE AMOUNT OF HORIZONTAL AND VERTICAL FOOTCANDLES ALONG THE SPECIFIED LINES. LIGHT LEVELS SHALL BE TAKEN AT 30-FOOT INTERVALS ALONG THE BOUNDARY LINE. READINGS SHALL BE TAKEN WITH THE METER ORIENTATION AT BOTH HORIZONTAL AND AIMED TOWARDS THE MOST INTENSE BANK OF LIGHTS. ILLUMINATION LEVEL SHALL BE MEASURED IN ACCORDANCE WITH THE IESNA LM-5-04 AFTER 1 HOUR WARM UP.

E. THE EFFICACY FOR FIELD AIMED FIXTURES MUST MEET DLC REQUIREMENT OF 105 LUMENS PER WATT.

F. THE FIRST PAGE OF A PHOTOMETRIC REPORT FOR ALL LUMINAIRE TYPES PROPOSED SHOWING HORIZONTAL AND VERTICAL AXIAL CANDLE POWER SHALL BE PROVIDED TO DEMONSTRATE THE CAPABILITY OF ACHIEVING THE SPECIFIED PERFORMANCE. REPORTS SHALL BE CERTIFIED BY A QUALIFIED TESTING LABORATORY WITH A MINIMUM OF FIVE YEARS EXPERIENCE OR BY A MANUFACTURER'S LABORATORY WITH A CURRENT ACCREDITATION UNDER THE NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR ENERGY EFFICIENT LIGHTING PRODUCTS. A SUMMARY OF THE HORIZONTAL AND VERTICAL AIMING ANGLES FOR EACH LUMINAIRE SHALL BE INCLUDED WITH THE PHOTOMETRIC REPORT.

#### G. UPPER BEAM DEFINITION

FIXTURES SHALL NOT EXCEED THE CANDLEPOWER AT THE SPECIFIED DEGREES ABOVE THE CENTER OF THE BEAM IN THE VERTICAL PLANE AS SPECIFIED IN THE FOLLOWING TABLE.

| NEMA Classification of | Candela | Degrees Above the Center of the |
|------------------------|---------|---------------------------------|
| Vertical Beam          |         | Beam in the Vertical Plane      |
| 4                      | 15,000  | 11.0 degrees                    |

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#### PART 2 - PRODUCT

- 2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION
- FACTORY ASSEMBLED, AIMED, WIRED AND TESTED.
- B. DURABILITY: ALL EXPOSED COMPONENTS SHALL BE CONSTRUCTED OF CORROSION RESISTANT MATERIAL AND/OR COATED TO HELP PREVENT CORROSION. ALL EXPOSED CARBON STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123. ALL EXPOSED ALUMINUM SHALL BE POWDER COATED WITH HIGH PERFORMANCE POLYESTER OR ANODIZED. ALL EXTERIOR REFLECTIVE INSERTS SHALL BE ANODIZED, COATED, AND PROTECTED FROM DIRECT ENVIRONMENTAL EXPOSURE TO PREVENT REFLECTIVE DEGRADATION OR CORROSION. ALL EXPOSED HARDWARE AND FASTENERS SHALL BE STAINLESS STEEL, PASSIVATED AND COATED WITH ALUMINUM-BASED THERMOSETTING EPOXY RESIN FOR PROTECTION AGAINST CORROSION AND STRESS CORROSION CRACKING. STRUCTURAL FASTENERS MAY BE CARBON STEEL AND GALVANIZED MEETING ASTM A153 AND ISO/EN 1461 (FOR HOT DIPPED GALVANIZING), OR ASTM B695 (FOR MECHANICAL GALVANIZING). ALL WIRING SHALL BE ENCLOSED WITHIN THE CROSS-ARMS, POLE, OR ELECTRICAL COMPONENTS ENCLOSURE.
- C. SYSTEM DESCRIPTION: LIGHTING SYSTEM SHALL CONSIST OF THE FOLLOWING:
- GALVANIZED STEEL POLES AND CROSS-ARM ASSEMBLY.
- a. EXISTING POLES: MANUFACTURE SHALL PROVIDE ALL NEW CROSSARMS. 2. MANUFACTURER WILL SUPPLY ALL DRIVERS AND SUPPORTING ELECTRICAL EQUIPMENT

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IN THE MANDATORY PRE-BID SUBMITTAL DETAILED IN SECTION 4.

INTEGRAL DRIVERS ARE NOT ACCEPTABLE.

- 5. WIRE HARNESS COMPLETE WITH AN ABRASION PROTECTION SLEEVE, STRAIN RELIEF AND PLUG-IN CONNECTIONS FOR FAST, TROUBLE-FREE INSTALLATION.
- 6. ALL LUMINAIRES, VISORS, AND CROSS-ARM ASSEMBLIES SHALL WITHSTAND 150 MI/H WINDS AND
- MAINTAIN LUMINAIRE AIMING ALIGNMENT. 7. CONTROL CABINET TO PROVIDE REMOTE ON-OFF CONTROL, MONITORING, OF THE LIGHTING SYSTEM. SEE SECTION 2.3 FOR FURTHER DETAILS.
- LISTED PER UL 96 AND UL 96A. a) CONTRACTOR TO PROVIDE NEW LIGHTNING GROUNDING ELECTRODE AT EACH POLE. GROUND RODS TO BE MINIMUM 5/8"X20' WITH A 20' EMBEDMENT. EXOTHERMIC FUSION TO BE USED FOR ALL BELOW GRADE BONDING.
- b) CONTRACTOR TO PROVIDE NEW LIGHTNING GROUNDING CONDUCTOR FROM POLE TOP TO GROUNDING ELECTRODE. BOND CONDUCTOR TO EACH CROSSARM ASSEMBLY AND DRIVER ENCLOSURE HANGER BRACKET. REQUIREMENT INCLUDES A #2 BARE STRANDED COPPER OR 1/0 BARE STRANDED ALUMINUM GROUND WIRE.

2.2 ELECTRICAL

- A. ELECTRIC POWER REQUIREMENTS FOR THE SPORTS LIGHTING EQUIPMENT: 1. ELECTRIC POWER: 480 VOLT, 3 PHASE
- 2. MAXIMUM TOTAL VOLTAGE DROPS: VOLTAGE DROP TO THE DISCONNECT SWITCH LOCATED ON THE POLES SHALL NOT EXCEED THREE (3) PERCENT OF THE RATED VOLTAGE.
- B. ENERGY CONSUMPTION: THE KW CONSUMPTION FOR THE FIELD LIGHTING SYSTEM SHALL BE • FOOTBALL FIELD - 42.5 KW OR LESS

2.3 CONTROL

- A. LIGHTS SHALL BE TURNED ON / OFF PRIMARILY USING CONTACTORS. UNDER NO CIRCUMSTANCES SHALL THE OWNER NEED TO SWITCH LIGHTS ON / OFF USING BREAKERS.
- B. INSTANT ON/OFF CAPABILITIES: SYSTEM SHALL PROVIDE FOR INSTANT ON/OFF OF LUMINAIRES
- C. LIGHTING CONTACTOR CABINET(S) WITH ELECTRICALLY-HELD CONTACTORS, CONSTRUCTED OF NEMA TYPE 4 ALUMINUM AND DESIGNED FOR EASY INSTALLATION WITH CONTACTORS LABELED TO MATCH FIELD DIAGRAMS AND ELECTRICAL DESIGN. MANUAL OFF-ON-AUTO SELECTOR SWITCHES SHALL BE PROVIDED.
- D. DIMMING: SYSTEM SHALL PROVIDE FOR 3-STAGE DIMMING (HIGH-MEDIUM-LOW). DIMMING WILL BE SET VIA SCHEDULING OPTIONS (WEBSITE, APP, PHONE, FAX, EMAIL)
- E. REMOTE LIGHTING CONTROL SYSTEM: SYSTEM SHALL ALLOW OWNER AND USERS WITH A SECURITY CODE TO SCHEDULE ON/OFF SYSTEM OPERATION VIA A WEB SITE, PHONE, FAX OR EMAIL UP TO TEN YEARS IN ADVANCE. MANUFACTURER SHALL PROVIDE AND MAINTAIN A TWO-WAY TCP/IP COMMUNICATION LINK. TRAINED STAFF SHALL BE AVAILABLE 24/7 TO PROVIDE SCHEDULING SUPPORT AND ASSIST WITH REPORTING NEEDS.

- CONTROLLER SHALL ACCEPT AND STORE 7-DAY SCHEDULES, BE PROTECTED AGAINST MEMORY LOSS DURING POWER OUTAGES, AND SHALL REBOOT ONCE POWER IS REGAINED AND EXECUTE ANY COMMANDS THAT WOULD HAVE OCCURRED DURING OUTAGE.
- F. REMOTE MONITORING SYSTEM: SYSTEM SHALL MONITOR LIGHTING PERFORMANCE AND NOTIFY MANUFACTURER IF INDIVIDUAL LUMINAIRE OUTAGE IS DETECTED SO THAT APPROPRIATE MAINTENANCE CAN BE SCHEDULED. THE CONTROLLER SHALL DETERMINE SWITCH POSITION (MANUAL OR AUTO) AND CONTACTOR STATUS (OPEN OR CLOSED).
- G. MANAGEMENT TOOLS: MANUFACTURER SHALL PROVIDE A WEB-BASED DATABASE AND DASHBOARD TOOL OF ACTUAL FIELD USAGE AND PROVIDE REPORTS BY FACILITY AND USER GROUP. DASHBOARD SHALL ALSO SHOW CURRENT STATUS OF LUMINAIRE OUTAGES, CONTROL OPERATION AND SERVICE. MOBILE APPLICATION WILL BE PROVIDED SUITABLE FOR IOS, ANDROID AND BLACKBERRY DEVICES.

PERMIT SET NOT TO BE USED FOR CONSTRUCTION

A. MANUFACTURING REQUIREMENTS: ALL COMPONENTS SHALL BE DESIGNED AND MANUFACTURED AS A SYSTEM. ALL LUMINAIRES, WIRE HARNESSES, DRIVERS AND OTHER ENCLOSURES SHALL BE

- a.REMOTE DRIVERS AND SUPPORTING ELECTRICAL EQUIPMENT SHALL BE MOUNTED APPROXIMATELY 10 FEET ABOVE GRADE IN ALUMINUM ENCLOSURES. THE ENCLOSURES SHALL BE TOUCH-SAFE AND INCLUDE DRIVERS AND FUSING WITH INDICATOR LIGHTS ON FUSES TO NOTIFY WHEN A FUSE IS TO BE REPLACED FOR EACH LUMINAIRE. DISCONNECT PER CIRCUIT FOR EACH POLE STRUCTURE WILL BE IN THE ENCLOSURE. INTEGRAL DRIVERS ARE NOT ALLOWED.
- b.MANUFACTURER SHALL PROVIDE SURGE PROTECTION AT THE POLE EQUAL TO OR GREATER THAN 40 KA FOR EACH LINE TO GROUND (COMMON MODE) AS RECOMMENDED BY IEEE
- IF ACTIVE COOLING FANS ARE UTILIZED IN THE REMOTE DRIVER ENCLOSURE, THEN THESE ARE REQUIRED TO BE WIRED FOR THE CONTROL SYSTEM TO SELF-MONITOR AND AUTOMATICALLY REPORT ANY FAILURE OR ISSUE TO THE MANUFACTURER AND/OR OWNER. TECHNICAL CUTSHEETS (NOT ILLUSTRATIVE) DETAILING THIS FUNCTION WOULD BE A REQUIRED INCLUSION
- 8. MANUFACTURER SHALL PROVIDE LIGHTNING GROUNDING AS DEFINED BY NFPA 780 AND BE UL
- D. SAFETY: ALL SYSTEM COMPONENTS SHALL BE UL LISTED FOR THE APPROPRIATE APPLICATION.

THE OWNER MAY ASSIGN VARIOUS SECURITY LEVELS TO SCHEDULERS BY FUNCTION AND/OR FIELDS. THIS FUNCTION MUST BE FLEXIBLE TO ALLOW A RANGE OF PRIVILEGES SUCH AS FULL SCHEDULING CAPABILITIES FOR ALL FIELDS TO ONLY HAVING PERMISSION TO EXECUTE "EARLY OFF" COMMANDS BY PHONE. SCHEDULING TOOL SHALL BE CAPABLE OF SETTING CURFEW LIMITS.

- HOURS OF USAGE: MANUFACTURER SHALL PROVIDE A MEANS OF TRACKING ACTUAL HOURS OF USAGE FOR THE FIELD LIGHTING SYSTEM THAT IS READILY ACCESSIBLE TO THE OWNER.
- 1. CUMULATIVE HOURS: SHALL BE TRACKED TO SHOW THE TOTAL HOURS USED BY THE FACILITY 2. REPORT HOURS SAVED BY USING EARLY OFF AND PUSH BUTTONS BY USERS.
- H. COMMUNICATION COSTS: MANUFACTURER SHALL INCLUDE COMMUNICATION COSTS FOR OPERATII THE CONTROL AND MONITORING SYSTEM FOR A PERIOD OF 10 YEARS.
- I. COMMUNICATION WITH LUMINAIRE DRIVERS: CONTROL SYSTEM SHALL INTERFACE WITH DRIVERS POLE-MOUNTED ENCLOSURES BY MEANS OF POWERLINE COMMUNICATION THROUGH THE UNDERGROUND CONDUCTORS.
- CONTROL SYSTEMS UTILIZING A WIRELESS LINE-OF-SIGHT COMMUNICATION PATHWAY TO THE LUMINAIRE DRIVERS WHERE POWER IS FED DIRECTLY FROM CIRCUIT BREAKER TO LIGHT POLE, AI IN WHICH POWER DISTRIBUTION TO THE POLE IS CONSTANT REGARDLESS OF ON/OFF LUMINAIRE STATUS -- ARE NOT ACCEPTABLE DUE TO LONG-TERM PERFORMANCE RELIABILITY RISKS.
- 2.4 STRUCTURAL PARAMETERS
- A. WIND LOADS: WIND LOADS SHALL BE BASED ON THE 2020 FLORIDA BUILDING CODE. WIND LOADS BE CALCULATED USING ASCE 7-10, AN ULTIMATE DESIGN WIND SPEED OF 175, HIGH VELOCITY HURRICANE ZONE, AND EXPOSURE CATEGORY C.
- PART 3 EXECUTION
- 3.1 DELIVERY TIMING
- A. DELIVERY TIMING EQUIPMENT ON-SITE: THE EQUIPMENT MUST BE ON-SITE 12 WEEKS FROM RECEIF OF APPROVED SUBMITTALS AND RECEIPT OF COMPLETE ORDER INFORMATION.
- 3.2 FIELD QUALITY CONTROL
- A. ILLUMINATION MEASUREMENTS: UPON SUBSTANTIAL COMPLETION OF THE PROJECT AND IN THE PRESENCE OF THE CONTRACTOR, PROJECT ENGINEER, OWNER'S REPRESENTATIVE, AND MANUFACTURER'S REPRESENTATIVE, ILLUMINATION MEASUREMENTS SHALL BE TAKEN AND VERIFIED. THE ILLUMINATION MEASUREMENTS SHALL BE CONDUCTED IN ACCORDANCE WITH IESN LM-5-04.
- B. FIELD LIGHT LEVEL ACCOUNTABILITY
- 1. LIGHT LEVELS ARE GUARANTEED NOT TO FALL BELOW THE TARGET MAINTAINED LIGHT LEVELS FOR THE ENTIRE WARRANTY PERIOD OF 10 YEARS. THESE LEVELS WILL BE SPECIFICALLY STATE AS "GUARANTEED" ON THE ILLUMINATION SUMMARY PROVIDED BY THE MANUFACTURER
- 2. THE CONTRACTOR/MANUFACTURER SHALL BE RESPONSIBLE FOR CONDUCTING INITIAL LIGHT LEVEL TESTING AND AN ADDITIONAL INSPECTION OF THE SYSTEM, IN THE PRESENCE OF THE OWNER, ONE YEAR FROM THE DATE OF COMMISSIONING OF THE LIGHTING.
- 3. THE CONTRACTOR/MANUFACTURER WILL BE HELD RESPONSIBLE FOR ANY AND ALL CHANGES NEEDED TO BRING THESE FIELDS BACK TO COMPLIANCE FOR LIGHT LEVELS AND UNIFORMITIES. CONTRACTOR/MANUFACTURER WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO THE FIELDS DURING THESE REPAIRS.
- C. CORRECTING NON-CONFORMANCE: IF, IN THE OPINION OF THE OWNER OR HIS APPOINTED REPRESENTATIVE, THE ACTUAL PERFORMANCE LEVELS INCLUDING FOOTCANDLES AND UNIFORMI RATIOS ARE NOT IN CONFORMANCE WITH THE REQUIREMENTS OF THE PERFORMANCE SPECIFICATIONS AND SUBMITTED INFORMATION, THE MANUFACTURER SHALL BE REQUIRED TO MA ADJUSTMENTS TO MEET SPECIFICATIONS AND SATISFY OWNER.
- 3.4 WARRANTY AND GUARANTEE
- A. 10-YEAR WARRANTY: EACH MANUFACTURER SHALL SUPPLY A SIGNED WARRANTY COVERING THE ENTIRE SYSTEM FOR 10 YEARS FROM THE DATE OF SHIPMENT. WARRANTY SHALL GUARANTEE SPECIFIED LIGHT LEVELS. MANUFACTURER SHALL MAINTAIN SPECIFICALLY-FUNDED FINANCIAL RESERVES TO ASSURE FULFILLMENT OF THE WARRANTY FOR THE FULL TERM. WARRANTY DOES NOT COVER WEATHER CONDITIONS EVENTS SUCH AS LIGHTNING OR HAIL DAMAGE, IMPROPER INSTALLATION, VANDALISM OR ABUSE, UNAUTHORIZED REPAIRS OR ALTERATIONS, OR PRODUCT MADE BY OTHER MANUFACTURERS.
- B. MAINTENANCE: MANUFACTURER SHALL MONITOR THE PERFORMANCE OF THE LIGHTING SYSTEM, INCLUDING ON/OFF STATUS. HOURS OF USAGE AND LUMINAIRE OUTAGE FOR 10 YEARS FROM THE DATE OF EQUIPMENT SHIPMENT. PARTS AND LABOR SHALL BE COVERED SUCH THAT INDIVIDUAL LUMINAIRE OUTAGES WILL BE REPAIRED WHEN THE USAGE OF ANY FIELD IS MATERIALLY IMPACTED. MANUFACTURER IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF FAILED LUMINAIRES, INCLUDING ALL PARTS, LABOR, SHIPPING, AND EQUIPMENT RENTAL ASSOCIATED WITH MAINTENANCE. OWNER AGREES TO CHECK FUSES IN THE EVENT OF A LUMINAIRE OUTAGE.
- PART 4 DESIGN APPROVAL
- 4.0 PRE-BID SUBMITTAL REQUIREMENTS
- A. DESIGN APPROVAL: THE OWNER / ENGINEER WILL REVIEW PRE-BID SUBMITTALS PER SECTION 4.0.B FROM ALL THE MANUFACTURERS TO ENSURE COMPLIANCE TO THE SPECIFICATION 10 DAYS PRIOR TO BID. IF THE DESIGN MEETS THE DESIGN REQUIREMENTS OF THE SPECIFICATIONS, A LETTER AND/OR ADDENDUM WILL BE ISSUED TO THE MANUFACTURER INDICATING APPROVAL FOR THE SPECIFIC DESIGN SUBMITTED.
- B. BASIS OF DESIGN PRODUCT: MUSCO'S LIGHT-STRUCTURE SYSTEMTM/ WITH TLC FOR LEDTM/ IS THE APPROVED PRODUCT OR EQUAL. ALL SUBSTITUTIONS MUST PROVIDE A COMPLETE SUBMITTAL PACKAGE FOR APPROVAL AS OUTLINED IN SUBMITTAL INFORMATION AT THE END OF THIS SECTION AT LEAST 10 DAYS PRIOR TO BID. SPECIAL MANUFACTURING TO MEET THE STANDARDS OF THIS SPECIFICATION MAY BE REQUIRED. AN ADDENDUM WILL BE ISSUED PRIOR TO BID LISTING ANY OTHER APPROVED LIGHTING MANUFACTURERS AND DESIGNS.
- C. ALL LISTED MANUFACTURERS NOT PRE-APPROVED SHALL SUBMIT THE INFORMATION AT THE END OF THIS SECTION AT LEAST 10 DAYS PRIOR TO BID. AN ADDENDUM WILL BE ISSUED PRIOR TO BID; LISTING APPROVED LIGHTING MANUFACTURERS AND THE DESIGN METHOD TO BE USED.
- D. BIDDERS ARE REQUIRED TO BID ONLY PRODUCTS THAT HAVE BEEN APPROVED BY THIS SPECIFICATION OR ADDENDUM BY THE OWNER OR OWNER'S REPRESENTATIVE. BIDS RECEIVED THAT DO NOT UTILIZE AN APPROVED SYSTEM/DESIGN, WILL BE REJECTED.

PART 5 - DESIGN APPROVAL

5.0 POST BID SUBMITTAL

- A. IN THE EVENT THAT A MANUFACTURER PROVIDES A SUBMITTAL THAT IS DEEMED TO BE INCOMPLETE, THAT MANUFACTURER HAS 2 WEEKS MAXIMUM TO PROVIDE ALL REQUESTED INFORMATION. IF THE MANUFACTURER DOES NOT COMPLY WITH THIS TIMELINE, THEY WILL BE DEEMED NON-COMPLIANT AND THE SUBMITTALS WILL BE REJECTED.
- B. REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID
- C. ALL ITEMS LISTED BELOW ARE MANDATORY, SHALL COMPLY WITH THE SPECIFICATION AND BE SUBMITTED ACCORDING TO PRE-BID SUBMITTAL REQUIREMENTS. COMPLETE THE YES/NO COLUMN TO INDICATE COMPLIANCE (Y) OR NONCOMPLIANCE (N) FOR EACH ITEM. SUBMIT CHECKLIST BELOW WITH SUBMITTAL.

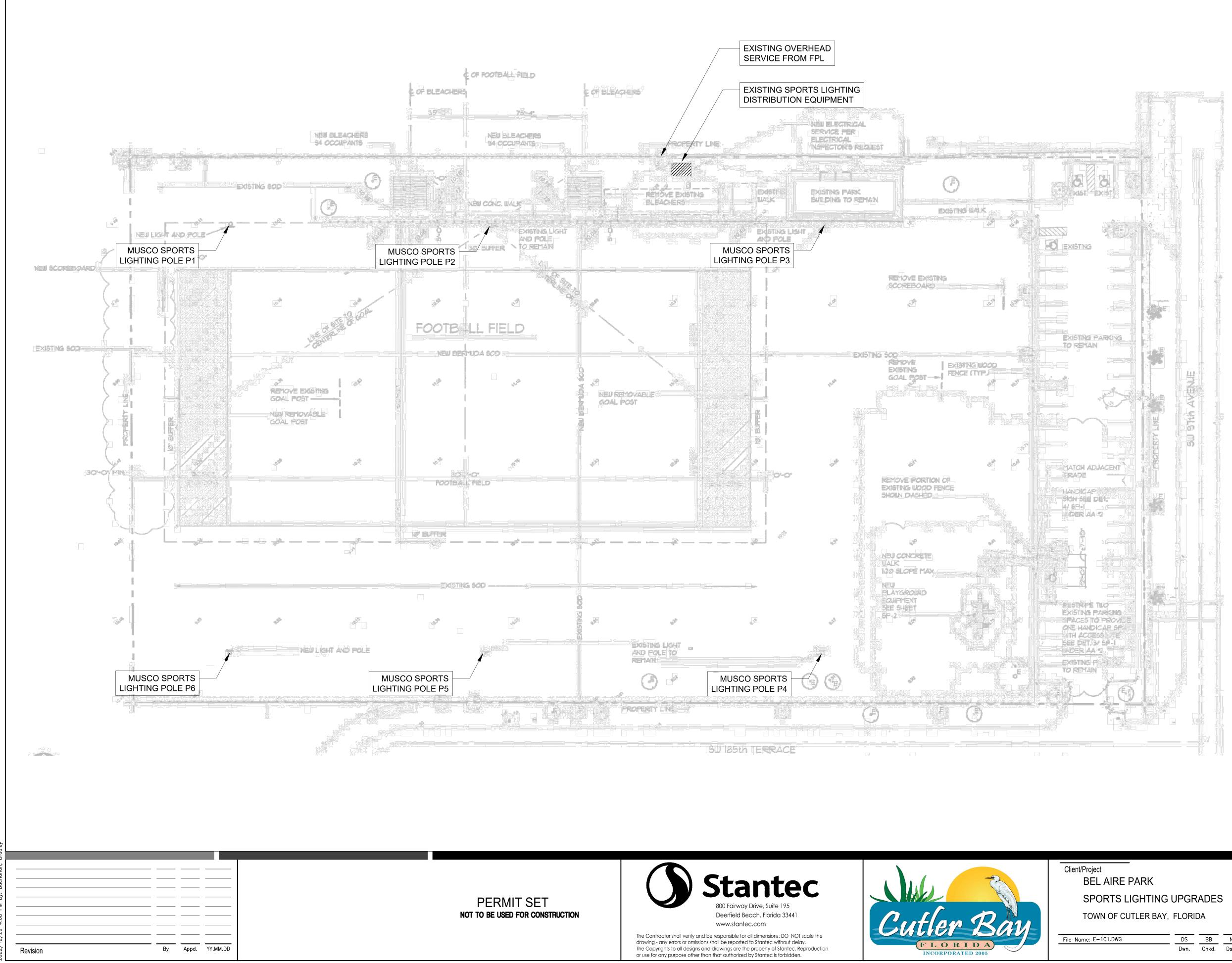


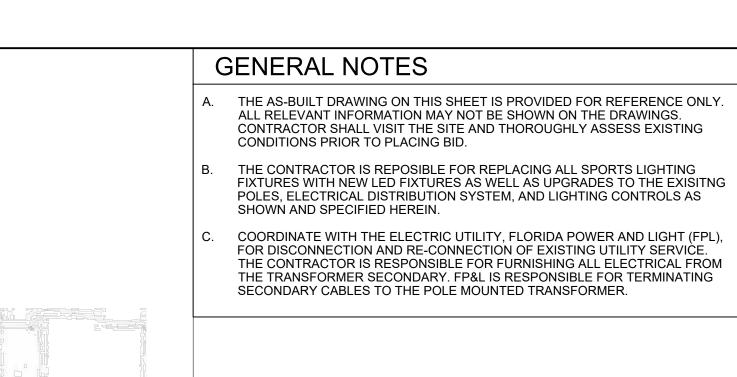
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.



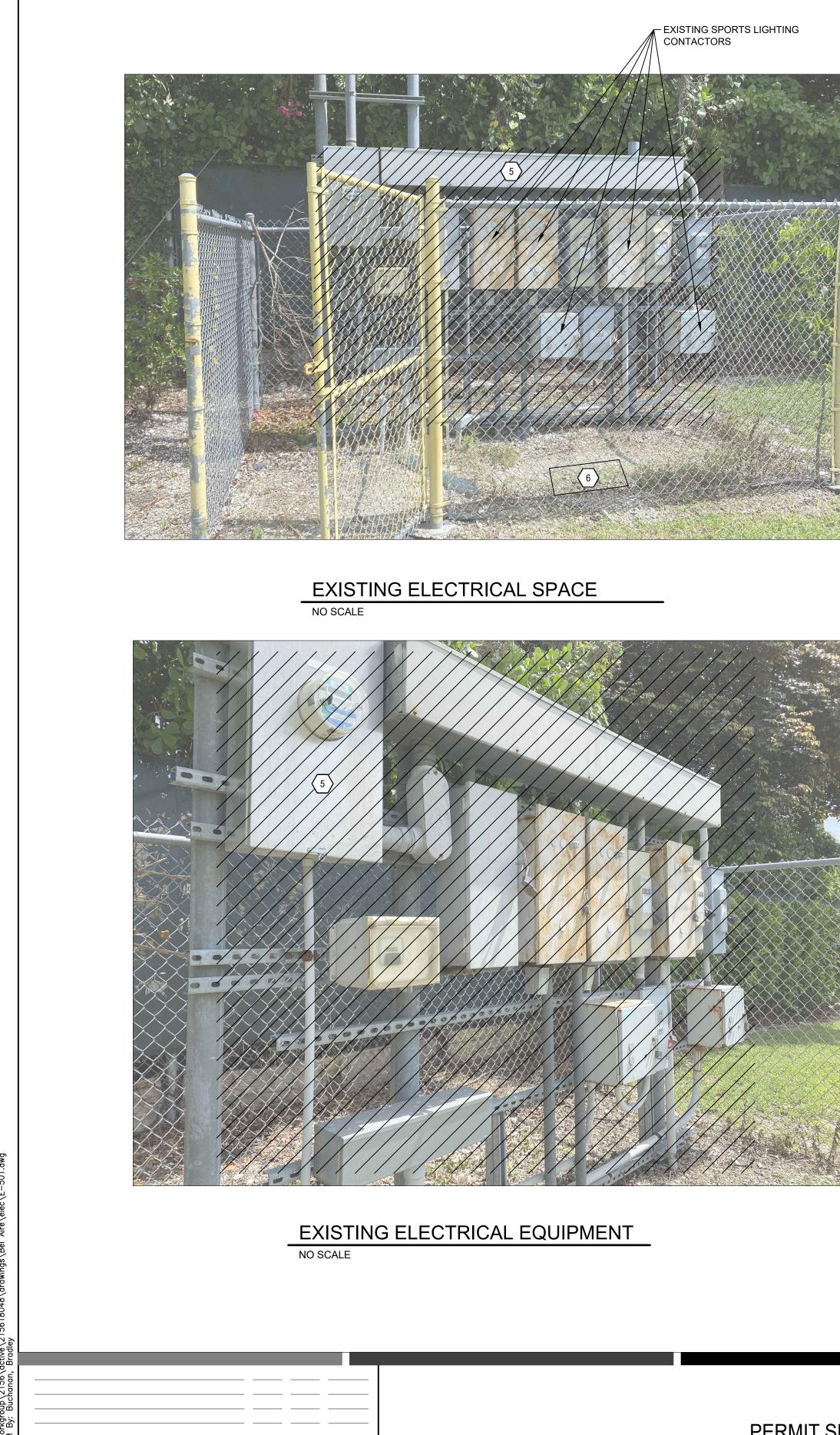
|   | Yes/<br>No | Tab | ltem                              | Description  |
|---|------------|-----|-----------------------------------|--|
|   |            | А   | Letter/<br>Checklist              | Listing of all information being submitted must be included on the table<br>of contents. List the name of the manufacturer's local representative and<br>his/her phone number. Signed submittal checklist to be included.  |
| IG  |            | в   | Equipment<br>Layout               | Drawing(s) showing field layouts with pole locations   |
| N<br>ND<br>TO   |            | С   | On Field<br>Lighting<br>Design    | <ul> <li>Lighting design drawing(s) showing:</li> <li>a. Field Name, date, file number, prepared by</li> <li>b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x &amp; y), Illuminance levels at grid spacing specified</li> <li>c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens and optics</li> <li>d. Height of light test meter above field surface.</li> <li>e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.</li> <li>f. Technical document addressing the issue of lighting in the vertical plane above the playing surface for aerial sports while achieving the desired glare control requirements.</li> </ul> |
| A   |            | D   | Off Field<br>Lighting<br>Design   | Lighting design drawing showing initial spill light levels along the<br>boundary line (defined on bid drawings) in footcandles. Lighting design<br>showing glare along the boundary line in candela. Light levels shall be<br>taken at 30-foot intervals along the boundary line. Readings shall be<br>taken with the meter orientation at both horizontal and aimed towards<br>the most intense bank of lights.   |
| D   |            | E   | Photometric<br>Report             | Provide first page of photometric report for all luminaire types being<br>proposed showing candela tabulations as defined by IESNA<br>Publication LM-35-02. Photometric data shall be certified by laboratory<br>with current National Voluntary Laboratory Accreditation Program or an<br>independent testing facility with over 5 years experience. No partial<br>wattage fixture reports or ISO Polar curve reports are acceptable.   |
|   |            | F   | Performance<br>Guarantee          | Provide performance guarantee including a written commitment to<br>undertake all corrections required to meet the performance<br>requirements noted in these specifications at no expense to the owner.<br>Light levels must be guaranteed to not fall below target levels for<br>warranty period.   |
| Υ<br><e< td=""><td></td><td>G</td><td>Structural<br/>Calculations</td><td>Pole structural calculations and foundation design showing foundation<br/>shape, depth backfill requirements, rebar and anchor bolts (if required).<br/>Pole base reaction forces shall be shown on the foundation drawing<br/>along with soil bearing pressures. Design must be stamped by a<br/>structural engineer in the state of FL, if required by owner. (May be<br/>supplied upon award).</td></e<> |            | G   | Structural<br>Calculations        | Pole structural calculations and foundation design showing foundation<br>shape, depth backfill requirements, rebar and anchor bolts (if required).<br>Pole base reaction forces shall be shown on the foundation drawing<br>along with soil bearing pressures. Design must be stamped by a<br>structural engineer in the state of FL, if required by owner. (May be<br>supplied upon award).   |
|   |            | Н   | Control &<br>Monitoring<br>System | Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of FL.  |
|   |            | I   | Electrical<br>Distribution        | Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance,   |

| —<br>E PARK  |            |             |             |                      | Title<br>LIGHTING S | Specifi    | CA | tions |               |   |
|--|------------|-------------|-------------|----------------------|---------------------|------------|----|-------|---------------|---|
| LIGHTING UPGRADESProject No.ScaleCUTLER BAY, FLORIDA215618048NO SC |            |             |             | SCALE                |                     |            | -  |       |               |   |
| 3  | DS<br>Dwn. | BB<br>Chkd. | NE<br>Dsgn. | 22.09.27<br>YY.MM.DD | Drawing No.         | Sheet<br>6 | of | 19    | Revision<br>0 | - |





| RE PARK                                    |                   |  |                      | Title<br>ELECTRICA         | -<br>Al SITE F | PLAI  | N (AS- | ·BUILT)       |
|--|-------------------|--|----------------------|----------------------------|----------------|-------|--------|---------------|
| S LIGHTING UPGRADES<br>CUTLER BAY, FLORIDA |                   |  |                      | Project No.<br>215618048   | Scale<br>NO S  | SCALE |        |               |
| VG   | DS BE<br>Dwn. Chk |  | 22.09.27<br>YY.MM.DD | Drawing No. <b>E - 101</b> | Sheet<br>7     | of    | 19     | Revision<br>0 |

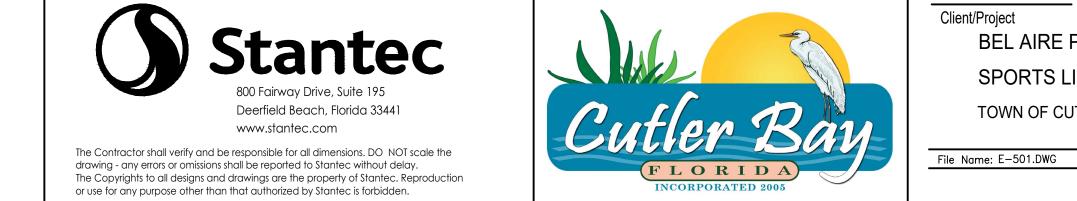


Revision

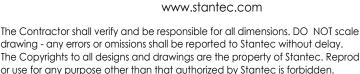
By Appd. YY.MM.DD



TYPICAL LIGHT POLE WORK NO SCALE

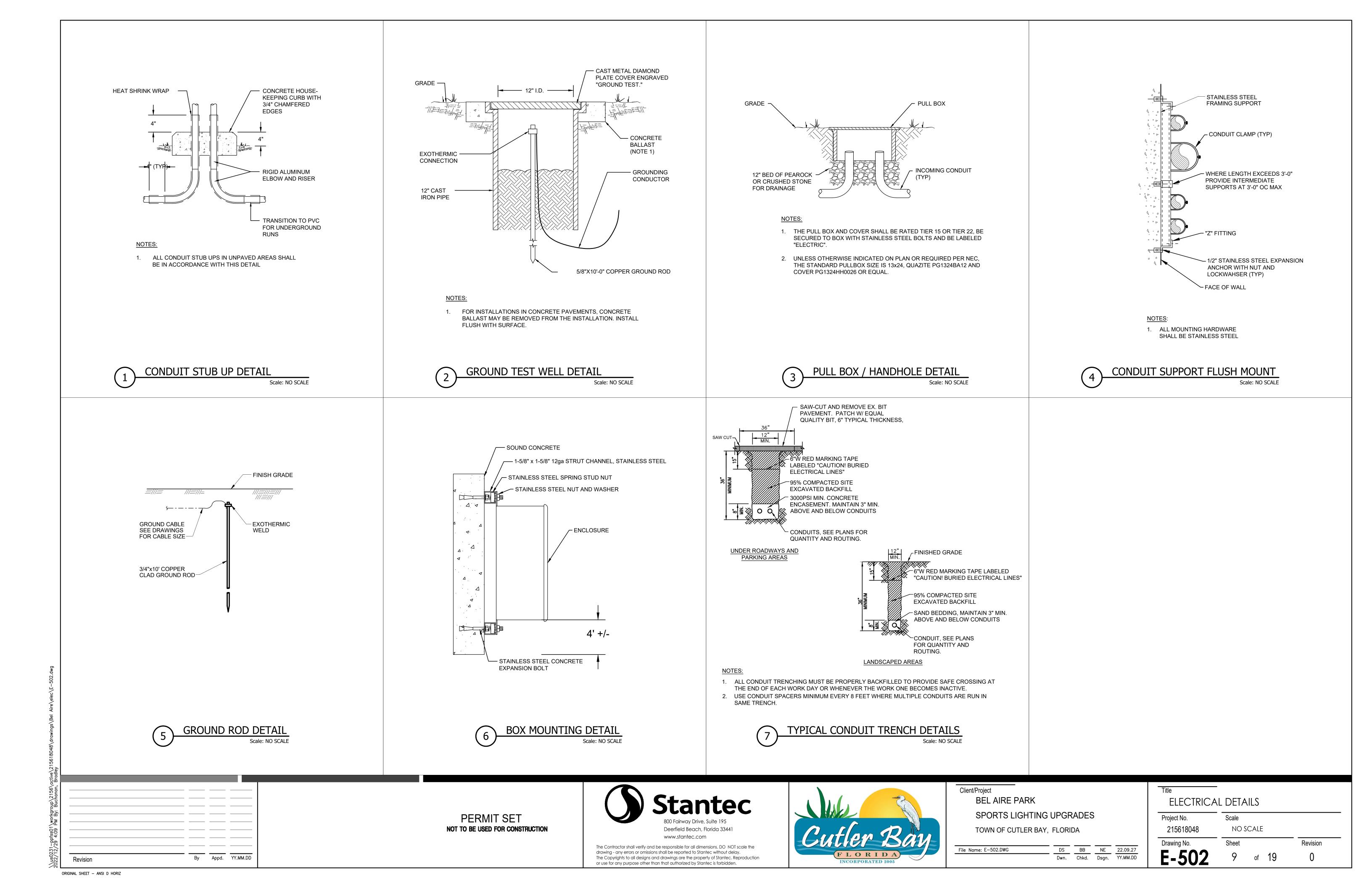


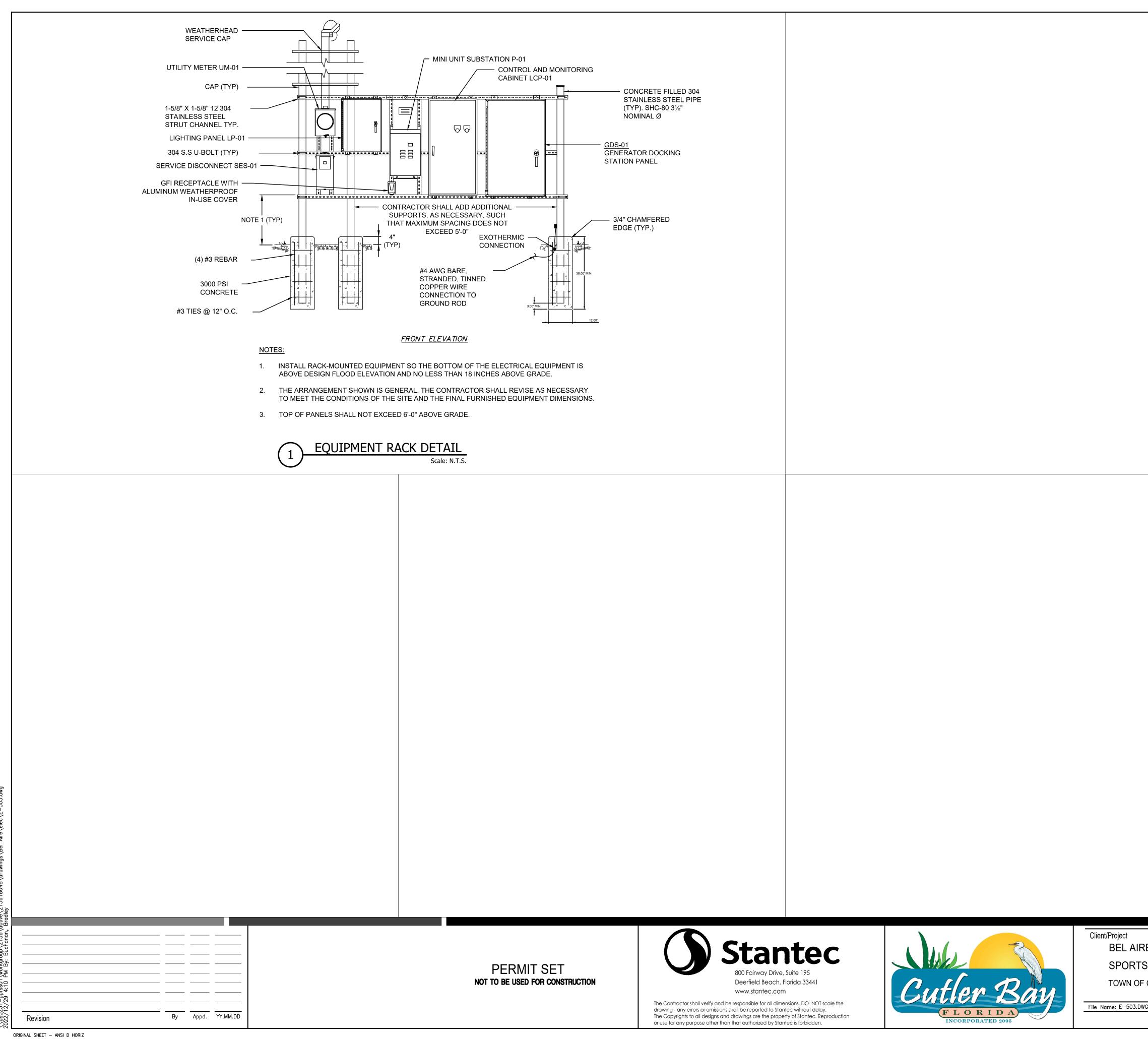
PERMIT SET NOT TO BE USED FOR CONSTRUCTION



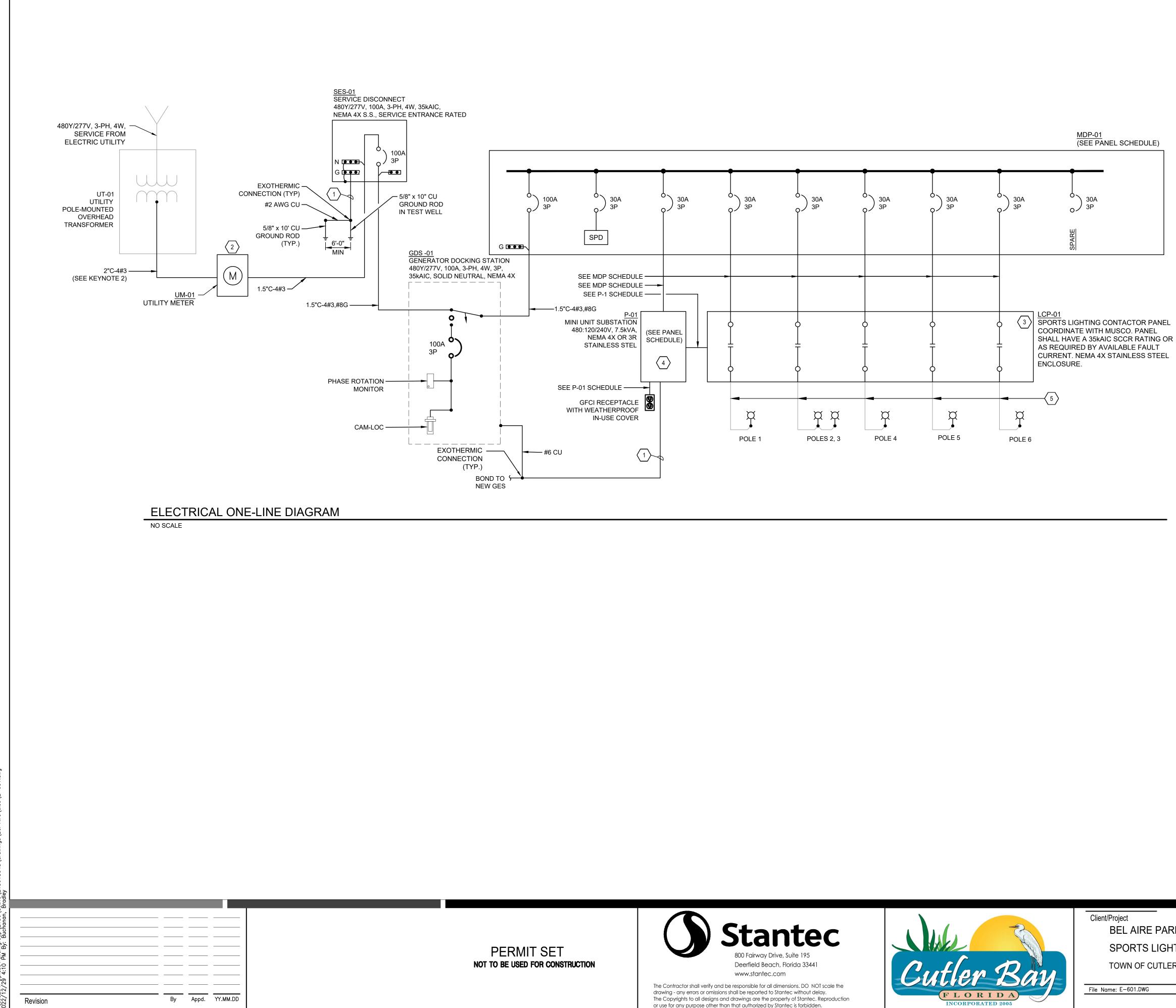
|           | GENERAL NOTES   |
|-----------|---|
| А         | . COORDINATE WITH THE ELECTRIC UTILITY, FLORIDA POWER AND LIGHT (FPL),<br>FOR DISCONNECTION AND RE-CONNECTION OF EXISTING UTILITY SERVICE. THE<br>CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL ELECTRICAL FROM THE<br>TRANSFORMER SECONDARY. FP&L IS RESPONSIBLE FOR TERMINATING<br>SECONDARY CABLES TO THE POLE MOUNTED TRANSFORMER.   |
| $\langle$ | > KEY NOTES   |
| 1.        | FURNISH AND INSTALL NEW LED LIGHT FIXTURES AND MOUNTING ARM BRACKETS.   |
| 2.        | FURNISH AND INSTALL NEW LIGHTING CONTROL CABINETS.  |
| 3.        | FURNISH AND INSTALL NEW GROUND ROD, DOWN CONDUCTOR AND LIGHTING ROD TERMINAL.   |
| 4.        | FURNISH AND INSTALL NEW LUMINAIRE CABLES PER MANUFACTURER<br>RECOMMENDATIONS. RUN CONDUCTORS INSIDE POLE. IF INSUFFICIENT SPACE IS<br>AVAILABLE, CONDUCTORS MAY BE RUN OUTSIDE OF POLE IN RIGID ALUMINUM<br>CONDUIT.  |
| 5.        | DEMOLISH AND REPLACE THE EXISTING EQUIPMENT RACK AND ALL ELECTRICAL<br>PANELS. THE EQUIPMENT RACK AND PANELS WILL BE REPLACED WITH NEW PER<br>SPECIFICATIONS. RE-CONNECT TO EXISTING POLES USING EXISTING WIRING.<br>REFER TO SHEET E-601 FOR CONNECTION DIAGRAM.   |
| 6.        | FURNISH AND INSTALL NEW MIN 24"x14"x18" PULLBOX. INTERCEPT CONDUITS TO<br>EXISTING LIGHT POLES UNDERGROUND, AND EXTEND TO THE NEW PULLBOX, AND<br>FROM THE NEW PULLBOX TO THE NEW CONTACTOR PANEL. THE PULLBOX SHALL<br>BE LOCATED WITHIN 10' OF THE CONTACTOR PANEL. IN THE EVENT THE EXISTING<br>CABLES ARE NOT OF SUFFICIENT LENGTH TO REACH THE NEW CONTACTOR<br>PANEL, THE CONTRACTOR SHALL FURNISH AND INSTALL NEW WIRE OF EQUAL<br>SIZE AND TYPE BETWEEN THE PULLBOX AND THE CONTACTOR PANEL AND SPLICE<br>WITHIN THE PULLBOX USING SUBMERGENCE RATED SPLICES. THE BID PRICE<br>SHALL INCLUDE THE COST OF THE THE PULLBOX AND SPLICES. |

| —                         | Title       | _          |          |
|---------------------------|-------------|------------|----------|
| E PARK                    | ELECTRIC/   | al details |          |
| LIGHTING UPGRADES         | Project No. | Scale      |          |
| CUTLER BAY, FLORIDA       | 215618048   | NO SCALE   |          |
| DS BB NE 22.09.27         | Drawing No. | Sheet      | Revision |
| Dwn. Chkd. Dsgn. YY.MM.DD | E-501       | 8 of 19    | 0        |





| —<br>—                    | Title       |          |             |
|---------------------------|-------------|----------|-------------|
| EPARK                     |             | DETAILS  |             |
| LIGHTING UPGRADES         | Project No. | Scale    |             |
| CUTLER BAY, FLORIDA       | 215618048   | NO SCALE | - <u>  </u> |
| G DS BB NE 22.09.27       | Drawing No. | Sheet    | Revision    |
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|                           |             |          |             |



### GENERAL NOTES

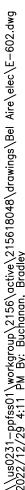
- A. PROVIDE NEW ELECTRICAL SERVICE AS SHOWN AND REPLACE ALL EXISTING EQUIPMENT.
- B. FURNISH, INSTALL, AND TERMINATE ALL WIRING, RACEWAYS, AND APPURTENANCES REQUIRED FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM.
- C. THE CONTRACTOR SHALL REQUEST THE MAXIMUM AVAILABLE FAULT CURRENT AT THE UTILITY TRANSFORMER FROM FP&L. ALL ELECTRICAL EQUIPMENT SHALL HAVE A SHORT CIRCUIT CURRENT RATING GREATER THAN THE AVAILABLE FAULT CURRENT. THE CONTRACTOR SHALL FURNISH AND INSTALL A UV AND WEATHER RESISTANT FAULT CURRENT LABEL AT THE SERVICE EQUIPMENT IN ACCORDANCE WITH NEC ARTICLE 110.24. RELATED CALCULATIONS SHALL BE IN ACCORDANCE WITH NFPA-70E, LATEST EDITION.

#### $\bigcirc$ KEY NOTES

- 1. #6 AWG GREEN INSULATED COPPER WIRE CONNECTION TO GROUNDING SYSTEM.
- 2. PROVIDE A NEMA 3R ALUMINUM OR STAINLESS STEEL METER. PROVIDE 2" RMC RISER TO WEATHERHEAD FOR OVERHEAD SERVICE. THE INSTALLATION SHALL MEET ALL UTILITY COMPANY REQUIREMENTS, FIELD COORDINATE WITH UTILITY AS REQUIRED.
- 3. NEMA 3R STAINLESS STEEL LIGHTING CONTROL AND MONITORING SYSTEM PANEL, FURNISHED BY MUSCO, SHALL BE INSTALLED, TESTED AND COMMISSIONED BY CONTRACTOR.
- 4. TRANSITION TO FLEXIBLE LIQUID-TIGHT METALLIC RACEWAY FOR CONNECTIONS TO MINI UNIT SUBSTATION (LIMIT 1' MAXIMUM).
- 5. EXISTING CONDUCTORS TO BE RE-USED TO THE GREATEST EXTENT PRACTICAL. SEE NOTES ON E-501 AND E-602.

| _           |            |             |             |                      | Title               | _        |          |
|-------------|------------|-------------|-------------|----------------------|---------------------|----------|----------|
| E PARK      |            |             |             |                      | ELECTRICAL ONE-LINE |          |          |
| LIGHTING    | UPGF       | RADES       | 5           |                      | Project No.         | Scale    |          |
| CUTLER BAY, | FLORI      | DA          |             |                      | 215618048           | NO SCALE |          |
|             |            |             |             |                      | Drawing No.         | Sheet    | Revision |
| i <u> </u>  | DS<br>Dwn. | BB<br>Chkd. | NE<br>Dsgn. | 22.09.27<br>YY.MM.DD | E-601               | 11 of 19 | 0        |

|                                   |                  |                   |  |             |          | L SCHEDUL    | .E             |                    |              |             |           |                 |     |        |                     |        |           |            | INI UNIT S | UBSTA | TION SC     | HEDULE   |              |       |          |      |            |
|-----------------------------------|------------------|-------------------|--|-------------|----------|--------------|----------------|--------------------|--------------|-------------|-----------|-----------------|-----|--------|---------------------|--------|-----------|------------|------------|-------|-------------|----------|--------------|-------|----------|------|------------|
| PANEL: MDP-01                     |                  |                   |  | AMPE        | RE RATI  | NG: 125A     |                |                    |              |             | MOU       | UNTING: SURFACE |     |        | P-01                |        | AMI       | PERE RATIN | NG:        | -     |             |          |              | MOUN  | TING:    |      | SURFACE    |
| VOLTS: 277 480                    |                  |                   |  | BUS         | 6 MATER  | AL: COPPE    | R              |                    |              |             | ENCL      | OSURE: NEMA 4X  | VOL | TS:    | 120 240             |        | BUS       | 6 MATERIAL | .:         | CO    | PPER        |          |              | ENCLO | SURE:    |      | NEMA 3R    |
| PHASE: 3                          |                  |                   |  | Μ           | AIN DEVI | CE: 100A     |                |                    |              |             | BRE       | EAKERS: BOLT-ON | PHA | SE:    | 1                   |        | MA        | N DEVICE:  |            | 20A   | (PRI), 40   | DA (SEC) | )            | BREAK | ERS:     |      | BOLT-ON    |
| WIRE: 4                           |                  |                   |  |             | SC       | CR: 35kA     |                |                    |              |             |           |                 | WIR | E:     | 3                   |        | SHO       | ORT CIRCUI | T RATING:  |       |             |          |              |       |          |      |            |
| LOAD DESCRIPTION                  | CON. W<br>SIZE S | IRE<br>IZE B      | <r #<="" *="" th=""><th>P</th><th>HASE LO</th><th>AD-KVA</th><th> I</th><th>3KR WIRE (</th><th>CON.<br/>SIZE</th><th></th><th>LOAD D</th><th>DESCRIPTION</th><th></th><th>L</th><th>OAD DESCRIPTION</th><th>CON</th><th></th><th>E BKR *</th><th># PHASE</th><th></th><th>-KVA<br/>B #</th><th>* BKI</th><th>R WIRE</th><th>CON.</th><th></th><th>LOAD</th><th>ESCRIPTION</th></r> | P           | HASE LO  | AD-KVA       | I              | 3KR WIRE (         | CON.<br>SIZE |             | LOAD D    | DESCRIPTION     |     | L      | OAD DESCRIPTION     | CON    |           | E BKR *    | # PHASE    |       | -KVA<br>B # | * BKI    | R WIRE       | CON.  |          | LOAD | ESCRIPTION |
|                                   |                  | · <u></u>         | C ·  | 1.95<br>0.2 |          |              |                |                    |              |             |           |                 | SPO | RTS LI | IGHTING CONTROL PA  |        |           | 2 20A C    |            |       |             | 2        |              |       | SPACE    |      |            |
| PORTS LIGHTING, POLE P1           | 1"               | #6 3              | DAC:   |             | 1.9      |              | N 2            | 20A<br>2P #12      | 1"  MI       | INI UNIT SU | JBSTATION | N               | GFC |        | EPTACLE             |        | 4" #1:    |            |            |       | .18         |          |              |       | SPACE    |      |            |
|                                   |                  |                   | C {  | 5           | 0.2      | 1.95         |                | 20A - 2P -         | - SP         | PARE        |           |                 | SPA | CE     |                     |        |           |            | 5          |       |             | 4        |              |       | SPACE    |      |            |
|                                   |                  |                   | C 7  | 4.48        |          | 0            |                | 20A<br>1P -        | - SP         | PARE        |           |                 | SPA |        |                     |        |           |            | 7          |       |             | 6        |              |       | SPACE    |      |            |
| PORTS LIGHTING, POLES P2, P3      | 1"               | #6 3              | DA C S   | 0           | 4.48     | 3            |                | 1P                 | - SP         | PARE        |           |                 | SPA |        |                     |        |           |            | 9          |       |             | 8        | _            |       | SPACE    |      |            |
|                                   |                  |                   | C 1  | 1           | 0        | 4.48         |                | 20A                |              | PARE        |           |                 | SPA |        |                     |        |           |            | 11         |       |             | 10       |              |       | SPACE    |      |            |
|                                   |                  |                   | C 1  | 3 2.59      |          | 0            |                | 1P -               |              | PARE        |           |                 |     |        |                     |        |           |            |            |       |             | 12       |              | <br>  | GH LEG L |      |            |
| PORTS LIGHTING, POLE P4           | 1"               | #6 3              | DAC1   | 0<br>5      | 2.5      |              |                | 1P -               |              | PARE        |           |                 |     |        |                     | 0.00-\ |           |            | 0.24       |       | .18         |          | 0.30         |       |          |      |            |
|                                   |                  | / 3               | DP<br>C 1  |             | 0        | 2.59         |                | 1P -               |              | PARE        |           |                 |     |        | UOUS X 125% (NEC 21 | U.20a) |           |            | 0.300      |       | 000         |          | 0.30<br>0.12 | KV    | - =      | 2.50 | AMPERES    |
|                                   |                  |                   | C 1  | 9 2.72      |          | 0            |                | 1P -               |              | PARE        |           |                 |     |        |                     |        | -04 40 15 |            | 0.000      |       | 180         |          |              |       |          |      |            |
| PORTS LIGHTING, POLE P5           | 1"               | #6 3              | DAC2   | 0           | 2.72     | 2            | 20<br>22<br>22 | 1P                 | - SP         |             |           |                 |     |        | R LOADS + LARGEST N |        | 5% (NE    | -C 220-14) | 0.000      |       | 000         |          |              |       |          |      |            |
|                                   |                  | +0 3              | P<br>C 2   |             | 0        | 2.72         |                | 20A                | - SP         |             |           |                 |     | AL CAL | LCULATED NEC LOAD   |        |           |            | 0.300      | ) 0   | 180         |          |              |       |          |      |            |
|                                   |                  |                   |  | 5 2.59      |          | 0            |                |                    | - SP         |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| PORTS LIGHTING, POLE P6           | 1"               | #6 3              | DAC2   | 0<br>7      | 2.5      | 9            |                |                    | - SP         |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
|                                   |                  | <sup>70</sup>   3 | P<br>C 2   |             | 0        | 2.59         |                | 20A                | - SP         |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| SPARE                             | _                | - 20              | )A 3   | 1 0         | _        | 0            |                | 20A                |              | PARE        |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| SPARE                             |                  | 1<br>- 20         | ·   .  | 0<br>3      | 0        |              |                | 1P<br>20A          | _ SP         | PARE        |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| SPARE                             |                  |                   | P<br>)A 3<br>P   | 5           | 0        | 0            |                | 1P -               | _ SP         | PARE        |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| SPARE                             |                  | 2                 | · .  | 7 0         | _        | 0            | 0              | 1P -               |              |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| SPARE                             |                  | 2                 | P<br>)A 3<br>P   | 9           | 0        |              | 38             | 30A -              | -            |             |           | SPD             |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| PARE                              | -                | 2                 | •  | 1           | 0        | 0            |                | or                 |              |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| OTAL CONNECTED LOAD               |                  | 1                 | r  | 14.53       | 14.5     | 0<br>3 14.33 | 42<br>3        |                    |              | HIGH LEG    | g load:   |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| C=CONTINUOUS X 125% (NEC 210.20a) |                  |                   |  | 17.91       | 17.9     |              |                | 18.11 K<br>0.277 K | KVA          | =           | 65.39     | 9 AMPERES       | 6   |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| I=NON-CONTINUOUS                  |                  |                   |  | 0.20        | 0.20     | 0.00         |                | U.ZII K            | <b>ν</b>     |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| /=LARGEST MOTOR X 125% (NEC 220-1 | 4)               |                   |  | 0.00        | 0.00     | 0.00         |                |                    |              |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |
| OTAL CALCULATED NEC LOAD          |                  |                   |  | 18 11       | 18 1     | 1 17.9       |                |                    |              |             |           |                 |     |        |                     |        |           |            |            |       |             |          |              |       |          |      |            |



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Revision

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### KEY NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE AND CONDITION OF THE EXISTING CONDUCTORS IN THE FIELD AND NOTIFY THE ENGINEER IF THE SIZE OR MATERIALS ARE DIFFERENT THAN THOSE SHOWN, OR IF THE CONDUCTORS ARE NOT IN SUITABLE CONDITION FOR REUSE.

| RE PARK                   |                     |             |                      |                          | –<br>Al PAN   | EL S  | CHED | ULES       |   |
|---------------------------|---------------------|-------------|----------------------|--------------------------|---------------|-------|------|------------|---|
| S LIGHTING<br>CUTLER BAY, |                     | S           |                      | Project No.<br>215618048 | Scale<br>NO S | Scale |      |            | - |
| WG                        | DS BB<br>Dwn. Chkd. | NE<br>Dsgn. | 22.09.27<br>YY.MM.DD | Drawing No.              | Sheet<br>12   | of    | 19   | Revision 0 | - |

## **Bel Aire Park Football Retrofit** Cutler Bay,FL

## Lighting System

| Pole / Fixtur | e Summary   |            |             |                |          |         |
|---------------|-------------|------------|-------------|----------------|----------|---------|
| Pole ID       | Pole Height | Mtg Height | Fixture Qty | Luminaire Type | Load     | Circuit |
| P1            | 60'         | 60'        | 4           | TLC-LED-1200   | 4.68 kW  | А       |
|               |             | 15'        | 1           | TLC-BT-575     | 0.58 kW  | А       |
| P2            | 60'         | 60'        | 5           | TLC-LED-1200   | 5.85 kW  | А       |
|               |             | 15'        | 2           | TLC-BT-575     | 1.15 kW  | А       |
| P3            | 60'         | 60'        | 5           | TLC-LED-1200   | 5.85 kW  | А       |
|               |             | 15'        | 1           | TLC-BT-575     | 0.58 kW  | А       |
| P4, P6        | 80'         | 80'        | 6           | TLC-LED-1200   | 7.02 kW  | А       |
|               |             | 15'        | 1           | TLC-BT-575     | 0.58 kW  | А       |
| P5            | 80'         | 80'        | 6           | TLC-LED-1200   | 7.02 kW  | А       |
|               |             | 15'        | 2           | TLC-BT-575     | 1.15 kW  | А       |
| 6             |             |            | 40          |                | 42.04 kW |         |

#### Circuit Summary

| on our ourn    | <b></b> y |                    |          |             |          |          |          |          |
|----------------|-----------|--------------------|----------|-------------|----------|----------|----------|----------|
| Circuit        |           | Description        | Load     | Fixture Qty |          |          |          |          |
| A              |           | Fleld              | 42.04 kW | 40          |          |          |          |          |
|                |           |                    | 1        | 1           | 1        |          |          |          |
| Fixture Type S | Summary   |                    |          |             |          |          |          |          |
| Туре           | 9         | Source             | Wattage  | Lumens      | L90      | L80      | L70      | Quantity |
| TLC-LED-       | -1200     | LED 5700K - 75 CRI | 1170W    | 136,000     | >120,000 | >120,000 | >120,000 | 32       |
| TLC-BT-        | -575      | LED 5700K - 75 CRI | 575W     | 52,000      | >120,000 | >120,000 | >120,000 | 8        |

## Light Level Summary

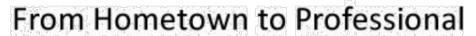
| Calculation Grid Summa | ry                              |      |     |                     |         |         |          |             |
|------------------------|---------------------------------|------|-----|---------------------|---------|---------|----------|-------------|
| Grid Name              | Calculation Metric              | Ave  | Min | Illumination<br>Max | Max/Min | Ave/Min | Circuits | Fixture Qty |
| Football Spill         | Horizontal Illuminance          | 0.02 | 0   | 0.08                | 111.54  |         | A        | 40          |
| Football Spill         | Max Candela Metric              | 2827 | 288 | 6778                | 23.51   | 9.80    | А        | 40          |
| Football Spill         | Max Vertical Illuminance Metric | 0.07 | 0   | 0.23                | 60.96   |         | A        | 40          |
| Football               | Horizontal Illuminance          | 31.4 | 20  | 47                  | 2.28    | 1.57    | A        | 40          |

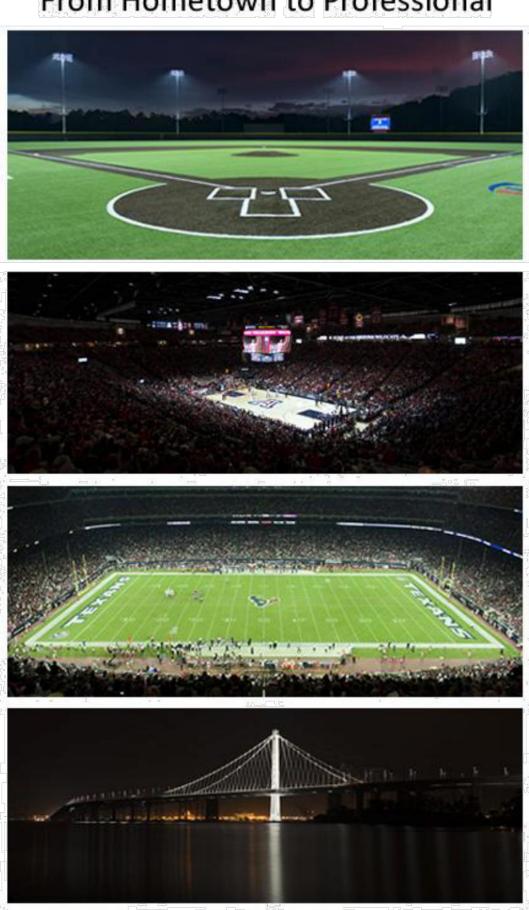
ENGINEERED DESIGN By: Noah Bix · File #188368B · 13-Jun-22

ŝ. 22/12/29

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| MEETS THE APPROVED PLAN SHALL BE PROVI<br>CERTIFICATE OF COMPLETION AND/OR OCCUP      |        | IOR TO T | THE ISSUAN | ICE OF ANY | (         |   |  |  |
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|   |        |          |            |            |           |   |  |  |
| Revision  | Ву     | Appd.    | YY.MM.DD   |            |           |   |  |  |

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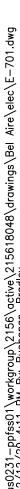
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| E PARK   |          |    |          | Title<br>MUSCO F         | –<br>'ROJEC <sup>-</sup> | r su, | MMAF | 2Y       |
|----------|----------|----|----------|--------------------------|--------------------------|-------|------|----------|
| LIGHTING | UPGRADES | 5  |          | Project No.<br>215618048 | Scale<br>NO S            | SCALE |      |          |
| 3        | DS BB    | NE | 22.09.27 | Drawing No.              | Sheet                    | of    | 19   | Revision |

| EQUIPMENT LIST FOR AREAS SHOWN         Image: transmission of the state of the   | FOU           |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |
|--|---------------|-----------|-----------------------|-------------|------------|------------|----------|--|--------------------|-----------------|--------|-----------|-----------|-----------------|----------|---------------|----------|----------------|---|
| $\frac{ \mathbf{r} \cdot \mathbf{r} - \mathbf{r}$ | EQU           |           | 24 M                  |             | LAS SI     |            | _        | Lumir  | aairos             | _               | _      |           |           |                 |          |               |          |                |   |
| $\frac{1}{1} \frac{p_1}{p_2} \frac{q_2}{q_1} \frac{q_1}{q_2} \frac{q_1}{q_2} \frac{q_1}{q_1} \frac{q_1}{q_2} \frac{q_1}{q_2} \frac{q_1}{q_1} \frac{q_1}{q_2} \frac{q_1}{q_2} \frac{q_1}{q_1} \frac{q_1}{q_2} \frac{q_1}{q$   | QTY           |           |                       |             |            |            | <b>i</b> | LUMINAIRE  | Q                  |                 |        |           |           |                 |          |               |          |                | 0   |
| $\frac{1}{2} \frac{P^2}{P^4, r^6} \frac{6\sigma^2}{8\sigma^2} \cdot \frac{1}{16\sigma^2} \frac{1}{10\sigma^2} \frac{1}{10\sigma^2}$  |               |           |                       | ELE         | -          |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |
| $\frac{1}{2} \frac{p_3}{2} \frac{60^{\circ}}{1} \frac{110^{\circ}}{10^{\circ}} \frac{110^{\circ}}{10^{\circ}}$   |               |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |
| 1       P3       60       135       Th CLEP 1200       1       1       0       0         2       P4, 16       80       135       Th CLEP 1200       6       6       0         1       1       0       0       0       0       0       0       0         1       1       0       0       0       0       0       0       0         1       1       0       0       0       0       0       0       0         1       1       0       0       0       0       0       0       0       0         1       0       0       0       0       0       0       0       0       0         1       0       34       35       37       35       31       27       31       35       28       31       30       29       29       34       33       77         35       34       35       35       35       31       27       31       35       28       26       26       25       26       27       29       32       34       30       29       29       31       30       29 <td>1</td> <td>P2</td> <td>60'</td> <td></td> <td>-</td> <td></td>   | 1             | P2        | 60'                   |             | -          |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |
| $\frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{1} + \frac{1}$   | 1             | P3        | 60'                   |             | -          | 15'        |          | TLC-BT-57  | 5                  | 1 1             | 0      |           |           |                 |          |               |          |                |   |
| $\frac{1}{9} + \frac{1}{9} + \frac{1}$   | 2             | P4, P6    | 80'                   |             | -          |            |          | TLC-BT-57  | 5                  |                 |        |           | 2         |                 |          |               | 0        | 1              | Commenter.  |
| $ \underbrace{ \begin{array}{c} \\ \hline \\ $   | 1             | P5        | 80'                   |             | -          | 15'        |          |  |                    |                 | _      | -         |           | H               |          | . 1984        |          | 165            |   |
| $\mathbb{P} = \begin{bmatrix} P_{1} & P_{2} & P_{3} & P_{$   | 6             |           |                       |             | τοται ς    |            | <u> </u> | .C-LED-12  |                    |                 |        | de la     |           |                 | 2 Selio  |               | No all   | and the second | hard and the  |
| $SALE IN FET 1: 80 = \frac{1}{8^{2}} + \frac{1}{10^{2}} + $   |               |           | and the second second | Annall      | TOTALS     | 1000       | 1000     |  | 1.6                | +0 +0           |        | 1         |           |                 |          |               |          |                | -   |
| $SALE IN FET 1: 80 = \frac{1}{8^{2}} + \frac{1}{10^{2}} + $   |               |           | 1                     |             |            |            |          | Carlo Carlo  |                    |                 |        |           | - Interio | 1.              |          |               | 1        | 120            | and the second  |
| $SALE IN FET 1: 80 = \frac{1}{8^{2}} + \frac{1}{10^{2}} + $   |               | 1         |                       |             |            |            |          |  |                    |                 | -      |           |           |                 |          |               |          |                |   |
| $\mathbb{P} = \mathbb{P} = $         |               |           |                       | P1          | 175        | Sta in     |          |  | D2 1               | 31'             | - 120  | 10        |           |                 |          | 180'          | Da       |                |   |
| $\mathbb{P} = \underbrace{\sum_{i=1}^{n} \frac{1}{40} + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + $  | -5-6          |           |                       | -+          |            | math me    | AP - T   |  |                    |                 | -      |           |           |                 | Martin 1 | >             | P3       | and -          | the second second   |
| $ \sum_{i=1}^{31} 40^{i} 34^{i} 35^{i} 37^{i} 35^{i} 49^{i} 31^{i} 35^{i} 31^{i} 27^{i} 31^{i} 35^{i} 28^{i} 31^{i} 11^{i} 35^{i} 44^{i} 40^{i} 43^{i} 38^{i} 33^{i} 35^{i} 35^{i} 37^{i} 37^{i} 35^{i} 35^{i} 33^{i} 36^{i} 43^{i} 42^{i} 12^{i} 27^{i} 29^{i} 32^{i} 34^{i} 34^{i} 31^{i} 29^{i} 26^{i} 27^{i} 26^{i} 25^{i} 26^{i} 29^{i} 27^{i} 22^{i} 12^{i} 27^{i} 29^{i} 32^{i} 33^{i} 31^{i} 30^{i} 28^{i} 26^{i} 26^{i} 25^{i} 24^{i} 25^{i} 27^{i} 26^{i} 21^{i} 12^{i} 33^{i} 35^{i} 35^{i} 33^{i} 31^{i} 30^{i} 29^{i} 28^{i} 27^{i} 27^{i} 27^{i} 29^{i} 32^{i} 24^{i} 33^{i} 35^{i} 35^{i} 33^{i} 31^{i} 30^{i} 29^{i} 28^{i} 27^{i} 27^{i} 27^{i} 29^{i} 32^{i} 24^{i} 38^{i} 35^{i} 33^{i} 31^{i} 30^{i} 29^{i} 29^{i} 29^{i} 29^{i} 31^{i} 44^{i} 38^{i} 35^{i} 42^{i} 31^{i} 33^{i} 31^{i} 29^{i} 25^{i} 25^{i} 27^{i} 24^{i} 24^{i} 23^{i} 24^{i} 26^{i} 35^{i} 35^{i} 33^{i} 31^{i} 29^{i} 29^{i} 25^{i} 27^{i} 24^{i} 24^{i} 23^{i} 24^{i} 26^{i} 35^{i} 35^{i} 33^{i} 31^{i} 29^{i} 29^{i} 25^{i} 27^{i} 24^{i} 24^{i} 23^{i} 24^{i} 26^{i} 35^{i} 35^{i} 33^{i} 31^{i} 29^{i} 29^{i} 25^{i} 27^{i} 24^{i} 24^{i} 23^{i} 24^{i} 26^{i} 35^{i} 35^{i} 33^{i} 31^{i} 29^{i} 29^{i} 25^{i} 27^{i} 27^{i} 29^{i} 32^{i} 4^{i} 43^{i} 38^{i} 35^{i} 42^{i} 31^{i} 33^{i} 31^{i} 29^{i} 29^{i} 25^{i} 27^{i} 24^{i} 24^{i} 23^{i} 24^{i} 26^{i} 35^{i} 35^{i} 33^{i} 41^{i} 4$  |               |           |                       |             | ٢          |            |          |  | A +                | 12.0-1-         |        |           |           |                 |          | Ψ             | <b>T</b> |                | - al  |
| $M_{1} = M_{1} + M_{1$   | The second    |           |                       |             |            |            |          |  | - m                |                 | ~ ~    | _         |           |                 |          |               |          | -              |   |
| $M_{1} = M_{1} + M_{2} + M_{2$   |               |           | 31                    | 40          | -34        | _35        | _37      | _35  | .29                | .31             | _35    | _31       | .27       | <sub>-</sub> 31 | _35      | _28           | _31      | 41             |   |
| $M_{1} = M_{1} + M_{2} + M_{2$   |               |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                | 1   |
| $M_{1} = M_{1} + M_{2} + M_{2$   | -             |           | 35                    | 44          | 40         | 43         | 38       | 33   | 35                 | 35              | 37     | 37        | 35        | 35              | .33      | 36            | 43       | 42             |   |
| $M_{1}^{2} = \frac{27}{29} + \frac{29}{32} + \frac{34}{33} + \frac{34}{31} + \frac{29}{29} + \frac{26}{27} + \frac{27}{26} + \frac{25}{25} + \frac{26}{29} + \frac{27}{27} + \frac{2}{29} $   | -20           |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |
| $M_{1}^{2} = \frac{1}{27} + \frac{27}{29} + \frac{29}{32} + \frac{34}{33} + \frac{34}{31} + \frac{29}{29} + \frac{26}{27} + \frac{27}{26} + \frac{25}{25} + \frac{26}{26} + \frac{29}{27} + \frac{27}{26} + \frac{2}{26} + \frac{1}{25} + \frac{1}{25}$   |               |           | 6.5                   | 00          | 0.4        | 0.5        | 0.5      | 0.0  | 0.0                | 00              | 00     | 04        | 00        | 00              |          | 0.4           | 0.0      | 67             |   |
| $\mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} $   |               |           | 25                    | -33         | -34        | _35        | _35      | _36  | _33                | _32             | -30    | -31       | -30       | 29              | -29      | 34            | _33      | 21             | a state of the second   |
| $\mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} $   |               |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 | I.B.C.   |               |          | 1              | C   |
| $\mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} = \mathbb{E}_{1} = \mathbb{E}_{0} $   | of the second |           | 21                    | 27          | 29         | 32         | 34       | 34   | .31                | 29              | 26     | 27        | 26        | 25              | 26       | 29            | 27       | 22             | i   |
| $\sum_{\sigma_{1}}^{20} \sum_{\theta_{2}}^{27} 2^{\theta} 3^{2} 3^{3} 3^{1} 3^{0} 2^{\theta} 2^{\theta$   | A starter     |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          | -              | i   |
| $E = \sum_{j=1}^{2} \sum_{k=1}^{3} \frac{3}{k^{2}} $   | 1             |           |                       | ~           |            |            |          |  |                    |                 |        |           |           | ~ 1             |          |               |          |                | F   |
| $\mathbb{E}_{0}^{37} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{38} \mathbb{E}_{0}^{35} \mathbb{E}_{0}^{32} \mathbb{E}_{0}^{31} \mathbb{E}_{0}^{30} $   |               |           | 20                    | 21          | _29        | _32        | _33      | _31  | _30                | .28             | _26    | 26        | .25       | -24             | .25      | 27            | _26      | 21             | The second se |
| $\mathbb{E}_{0}^{37} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{38} \mathbb{E}_{0}^{35} \mathbb{E}_{0}^{32} \mathbb{E}_{0}^{31} \mathbb{E}_{0}^{30} $   | 100           |           | 1 100 F               |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          | -              |   |
| $\mathbb{E}_{0}^{37} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{39} \mathbb{E}_{0}^{38} \mathbb{E}_{0}^{35} \mathbb{E}_{0}^{32} \mathbb{E}_{0}^{31} \mathbb{E}_{0}^{30} $   |               |           | 25                    | 34          | 33         | 35         | 35       | 33   | .31                | 30              | 29     | 28        | 27        | 27              | .27      | 29            | 32       | 24             |   |
| $M_{1}^{2} = M_{2}^{2} + M_{2$   | - win         |           |                       |             |            |            |          |  | Art and            |                 |        |           |           |                 |          | Sector Sector |          |                | f   |
| $M_{1}^{2} = M_{2}^{2} + M_{2$   | AV S          | French    | 67                    |             |            | 00         | 00       | 0.5  | 00                 | 01              | 00     | 00        | 00        | 00              | 00       | ~             |          | 60             | - C   |
| E = E = E = E = E = E = E = E = E = E =  | 2.1           | 6         | 37                    |             | 39         | -39        | -38      | _35  | -32                | <sub>-</sub> 31 | -30    | -30       | -30       | 29              | ,29      | -31           | 44       | 38             | r   |
| $E = \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$  |               |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                | A Stat  |
| $E = \frac{1}{2} = \frac{1}{2} = \frac{1}{2}$  | 1.00          |           | 35                    | 42          | .31        | .33        | _31      | 29   | ,25                | .25             | 27     | 24        | .24       | 23              | .24      | _26           | .35      | 35             | Chi The I   |
| $F_{0} = \frac{1}{176}$ $F_{0} = \frac{1}{36}$ $F_{0} = \frac{1}{36}$ $F_{0} = \frac{1}{36}$ $F_{0} = \frac{1}{177}$   |               |           |                       |             |            | 2.4.6      |          |  |                    |                 |        |           |           |                 |          |               | haller   |                | 2003  |
| $P6 \downarrow 176 P3 \downarrow 36 P5 \downarrow 36 P4$ $T77 \downarrow P4$ $P4 \downarrow 777 \downarrow P4$ $P5 \downarrow 36 P5 \downarrow 36 P5 \downarrow 777 \downarrow P4$ $P6 \downarrow 1777 \downarrow P4$   | h-stall       |           |                       | 136         |            |            |          |  | 136                | 2.5             |        |           |           |                 |          |               | 137      |                | Alter and   |
| $E_{0} = \frac{1}{10^{10}} = \frac{1}$   |               |           |                       | <b>₹</b> €  | Þ          |            |          |  | ₽¢                 | 4               |        |           |           |                 |          | 0             | ¥        |                | and the second second   |
| $E_{0} = \frac{1}{10^{10}} = \frac{1}$   |               |           |                       | P6          | 176        |            |          |  | P5 🗲               | 36'             |        |           |           |                 | 2.207    | 177           | P4       |                | 712K-   |
| (N) $(N)$  |               |           |                       | Contract of |            |            |          |  |                    |                 |        |           |           |                 |          | 111           | 2 - 1    |                | and the second  |
| (N) $(N)$  | - 1           | a togette |                       |             | The second |            |          |  |                    |                 |        |           |           |                 |          |               |          |                | and a later of the  |
| (N) $(N)$  | 123           | Lesi      |                       | X           | 1          |            | Han T    |  |                    |                 |        |           |           |                 |          |               |          |                | 111 No.   |
| (N) $(N)$  | 200           |           |                       |             | 1.36       | and a      | 1        | inda   | andle              |                 | See.   |           |           | - Aller         |          |               |          |                |   |
| (N) $(N)$  |               |           |                       | 10          | THE        | A CONTRACT | X        | and the second s |                    |                 | D R    | <b>We</b> | REP.      | Andreas         | 2.10     | 1 15          |          | 1              |   |
| (N) $(N)$  |               |           | Ser.                  | Sel .       | 5075       |            | tel -    | RUF.   |                    | -               | . 1913 | Ser 1     | -         | I REDUT         | STR.     |               |          |                | an Care   |
| (N) $(N)$  |               | H CALLS   | 1                     |             | 12         |            | 21/53    | -  | Contraction of the |                 | - alto | 1         |           | 100             | 199      |               | 1 the    | - [1]          | A LINE AND  |
| to 0,0 reference point(s) 80' 160'   |               | SCALE     | E IN FEE              | ET 1 : 8    | 80         |            |          |  |                    |                 |        |           |           |                 | Pole loo | ation(s)      | 🕀 dimens | ions are rel   | ative   |
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| ENGINEERED DESIGN By: Noah Bix · File #188368B · 13-Jun-22   |               | 0'        |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                | N   |
|  | ENGIN         |           | DESIGN                | By: I       | Noah E     | Bix ∙ File | #1883    | 68B · 1  | .3-Jun-2           | 22              |        |           |           |                 |          |               |          |                | S   |
|  |               |           |                       |             |            |            |          |  |                    |                 |        |           |           |                 |          |               |          |                |   |



| \215618048\drawings\B<br>ey   | THIS PLAN SHEET IS FOR REFERENCE ONLY. THE FINAL PRODUCT WILL BE EVALUATED TO<br>ENSURE IT MEETS ALL PRODUCT SPECIFICATIONS REQUIRED AS PART OF THESE CONTRACT<br>DOCUMENTS. A CERTIFIED REPORT FROM AN ELECTRICAL OR LIGHTING ENGINEER OR<br>CONTRACTOR LICENSED IN THE STATE OF FLORIDA TO VERIFY THAT THE PHOTOMETRIC PLAN<br>MEETS THE APPROVED PLAN SHALL BE PROVIDED PRIOR TO THE ISSUANCE OF ANY<br>CERTIFICATE OF COMPLETION AND/OR OCCUPANCY. |                                |
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| \\us0231-ppfss01\workgroup\2156\active\21<br>2022/12/29 4:11 PM By: Buchanan, Bradley |  | PERMIT S<br>NOT TO BE USED FOR |

| <b>Bel Aire</b> | Park | Foot |
|-----------------|------|------|
| Cutler Bay, FL  |      |      |

| <b>GRID SUMMARY</b> |            |
|---------------------|------------|
| Name:               | Football   |
| Size:               | 450' x 230 |
| Spacing:            | 30.0' x 30 |
| Height:             | 3.0' abov  |

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| MAINTAINED HORIZONTA  | AL FOOTCAND |
|-----------------------|-------------|
|                       | Entire Grid |
| Guaranteed Average:   | 30          |
| Scan Average:         | 31.37       |
| Maximum:              | 47          |
| Minimum:              | 20          |
| Avg / Min:            | 1.54        |
| Guaranteed Max / Min: | 2.5         |
| Max / Min:            | 2.28        |
| UG (adjacent pts):    | 1.55        |
| CU:                   | 0.78        |
| No. of Points:        | 128         |
| LUMINAIRE INFORMATIO  | N           |
| Applied Circuits:     | Α           |
| No. of Luminaires:    | 40          |
| Total Load:           | 42.04 kW    |

Guaranteed Performance: The ILLU is guaranteed per your Musco Warr includes a 0.95 dirt depreciation fa

Field Measurements: Individual fie from computer-calculated prediction in accordance with IESNA RP-6-15.

Electrical System Requirements: R Draw Chart and/or the "Musco Con for electrical sizing.

Installation Requirements: Results nominal voltage at line side of the located within 3 feet (1m) of desigr



## We Make I

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**INCORPORATED 2005** 



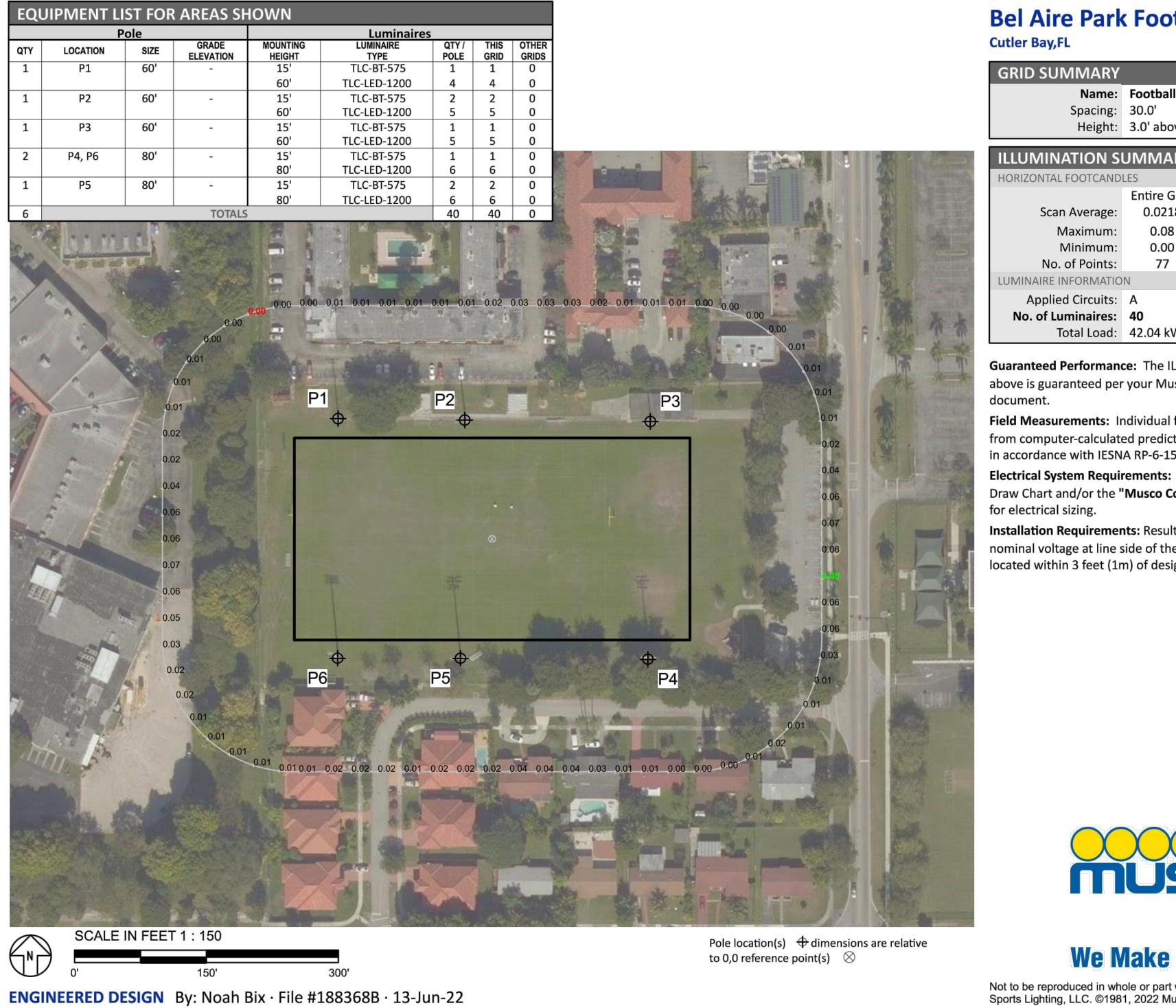
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| eld measurements may vary<br>ons and should be taken       |
| Refer to Amperage<br><b>ntrol System Summary''</b>         |
| s assume ± 3%<br>driver and structures<br>n locations.     |
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| <b>It Happen</b> ®<br>vithout the written consent of Musco |
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| ATION SUMMARY  |
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|  | Title       | -              |          |
|--|-------------|----------------|----------|
| PARK   | MUSCO IL    | LUMINATION SUM | MMARY    |
| LIGHTING UPGRADES                            | Project No. | Scale          |          |
| CUTLER BAY, FLORIDA                          | 215618048   | NO SCALE       |          |
|  | Drawing No. | Sheet          | Revision |
| <u>DSBBNE22.09.27</u><br>DwnChkdDsgnYY.MM.DD | E-702       | 14 of 19       | 0        |

| EQ  | EQUIPMENT LIST FOR AREAS SHOWN |         |                    |                    |       |  |  |  |  |
|-----|--------------------------------|---------|--------------------|--------------------|-------|--|--|--|--|
|     | P                              | ole     |                    |                    |       |  |  |  |  |
| QTY | LOCATION                       | SIZE    | GRADE<br>ELEVATION | Mounting<br>Height | LU    |  |  |  |  |
| 1   | P1                             | 60'     | -                  | 15'                | TLC   |  |  |  |  |
|     |                                |         |                    | 60'                | TLC-I |  |  |  |  |
| 1   | P2                             | 60'     | -                  | 15'                | TLC   |  |  |  |  |
|     |                                |         |                    | 60'                | TLC-I |  |  |  |  |
| 1   | P3                             | 60'     | -                  | 15'                | TLC   |  |  |  |  |
|     |                                |         |                    | 60'                | TLC-I |  |  |  |  |
| 2   | P4, P6                         | 80'     | -                  | 15'                | TLC   |  |  |  |  |
|     |                                |         |                    | 80'                | TLC-I |  |  |  |  |
| 1   | P5                             | 80'     | -                  | 15'                | TLC   |  |  |  |  |
|     |                                |         |                    | 80'                | TLC-I |  |  |  |  |
| 6   |                                | 32.<br> | TOTALS             |                    |       |  |  |  |  |
| 197 |                                |         |                    |                    |       |  |  |  |  |



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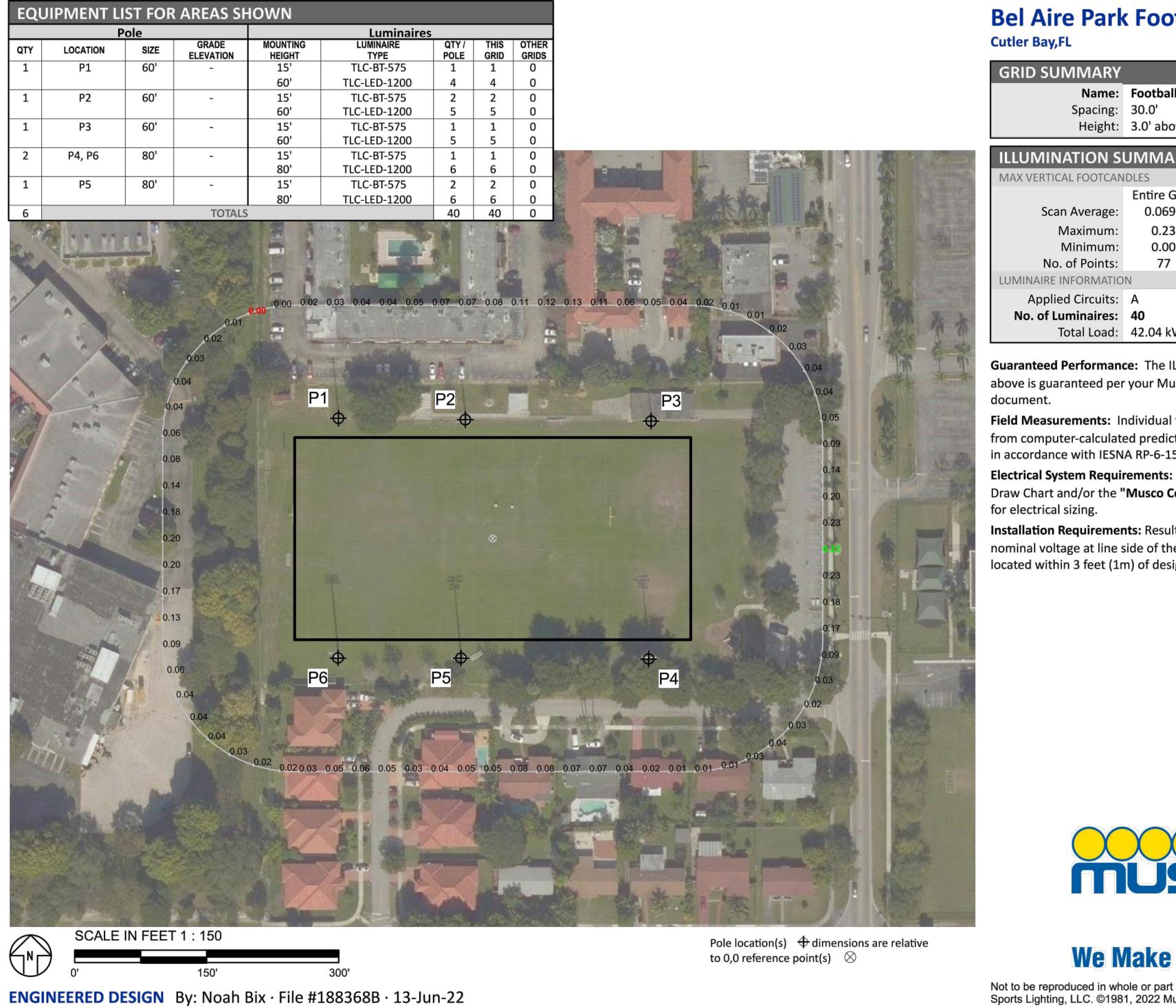
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File Name: E-701.DWG

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| ILLUMINATION described<br>usco Warranty                               |  |
| l field measurements may vary<br>ctions and should be taken<br>15.    |  |
| : Refer to Amperage<br>Control System Summary"                        |  |
| Ilts assume ± 3%<br>ne driver and structures<br>sign locations.       |  |
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| t without the written consent of Musco<br>Jusco Sports Lighting, LLC. |  |
| NATION SUMMARY  |  |
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| E PARK                                     |  | Title<br>MUSCO ILL         | .UMINATION SUM    | 1MARY         |
|--|--|----------------------------|-------------------|---------------|
| S LIGHTING UPGRADES<br>CUTLER BAY, FLORIDA |  | Project No.<br>215618048   | Scale<br>NO SCALE |               |
| VG   | DS BB NE 22.09.27<br>Dwn. Chkd. Dsgn. YY.MM.DD | Drawing No. <b>E - 703</b> | Sheet<br>15 of 19 | Revision<br>0 |

| EQUIPMENT LIST FOR AREAS SHOWN |          |      |                    |                    |       |  |  |  |  |
|--------------------------------|----------|------|--------------------|--------------------|-------|--|--|--|--|
|                                | P        | ole  |                    |                    |       |  |  |  |  |
| QTY                            | LOCATION | SIZE | GRADE<br>ELEVATION | Mounting<br>Height | LU    |  |  |  |  |
| 1                              | P1       | 60'  | -                  | 15'                | TLC   |  |  |  |  |
|                                |          |      |                    | 60'                | TLC-I |  |  |  |  |
| 1                              | P2       | 60'  | -                  | 15'                | TLC   |  |  |  |  |
|                                |          |      |                    | 60'                | TLC-I |  |  |  |  |
| 1                              | P3       | 60'  | -                  | 15'                | TLC   |  |  |  |  |
|                                |          |      |                    | 60'                | TLC-I |  |  |  |  |
| 2                              | P4, P6   | 80'  | -                  | 15'                | TLC   |  |  |  |  |
|                                |          |      |                    | 80'                | TLC-I |  |  |  |  |
| 1                              | P5       | 80'  | -                  | 15'                | TLC   |  |  |  |  |
|                                |          |      |                    | 80'                | TLC-I |  |  |  |  |
| 6                              |          |      | TOTALS             |                    |       |  |  |  |  |
| 195                            |          |      |                    |                    |       |  |  |  |  |



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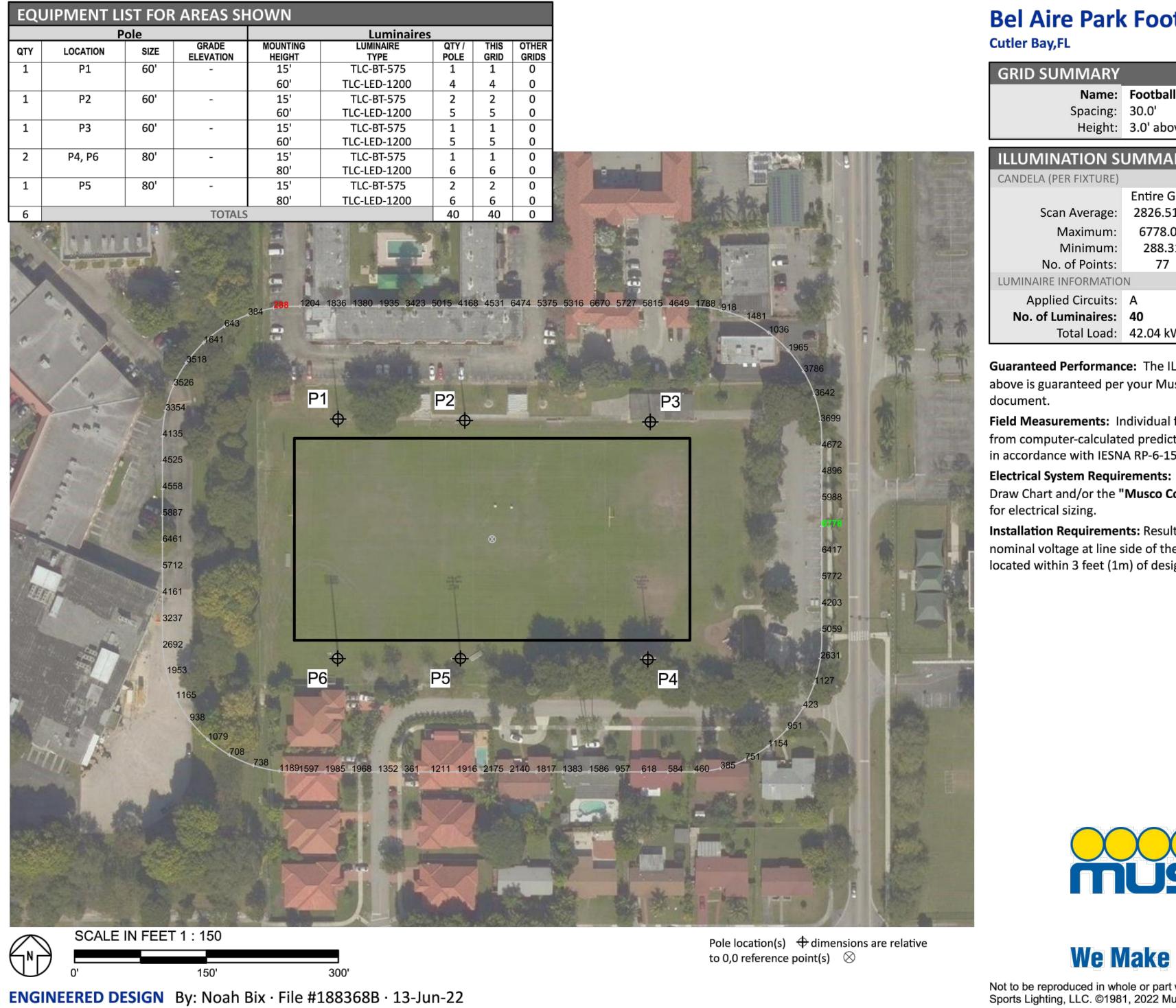
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| ults assume ± 3%<br>he driver and structures<br>sign locations.         |   |
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| rt without the written consent of Musco<br>/lusco Sports Lighting, LLC. |   |
| NATION SUMMARY  |   |
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|   | Title                    | _                 |          |
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| REPARK  | MUSCO IL                 | LUMINATION SUM    | MMARY    |
| S LIGHTING UPGRADES                               | Project No.<br>215618048 | Scale<br>NO SCALE |          |
| WG DS BB NE 22.09.27<br>Dwn. Chkd. Dsgn. YY.MM.DD | Drawing No.              | Sheet             | Revision |

| EQUIPMENT LIST FOR AREAS SHOWN |          |       |                    |                    |                |  |  |  |  |
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|                                | P        | ole   |                    |                    |                |  |  |  |  |
| QTY                            | LOCATION | SIZE  | GRADE<br>ELEVATION | Mounting<br>Height | LU             |  |  |  |  |
| 1                              | P1       | 60'   | -                  | 15'                | TLC            |  |  |  |  |
|                                |          |       |                    | 60'                | TLC-I          |  |  |  |  |
| 1                              | P2       | 60'   | -                  | 15'                | TLC            |  |  |  |  |
|                                |          |       |                    | 60'                | TLC-I          |  |  |  |  |
| 1                              | P3       | 60'   | -                  | 15'                | TLC            |  |  |  |  |
|                                |          |       |                    | 60'                | TLC-I          |  |  |  |  |
| 2                              | P4, P6   | 80'   | -                  | 15'                | TLC            |  |  |  |  |
|                                |          |       |                    | 80'                | TLC-I          |  |  |  |  |
| 1                              | P5       | 80'   | -                  | 15'                | TLC            |  |  |  |  |
|                                |          |       |                    | 80'                | TLC-I          |  |  |  |  |
| 6                              |          |       | TOTALS             | }                  |                |  |  |  |  |
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Client/Project **BEL AIRE** SPORTS TOWN OF (

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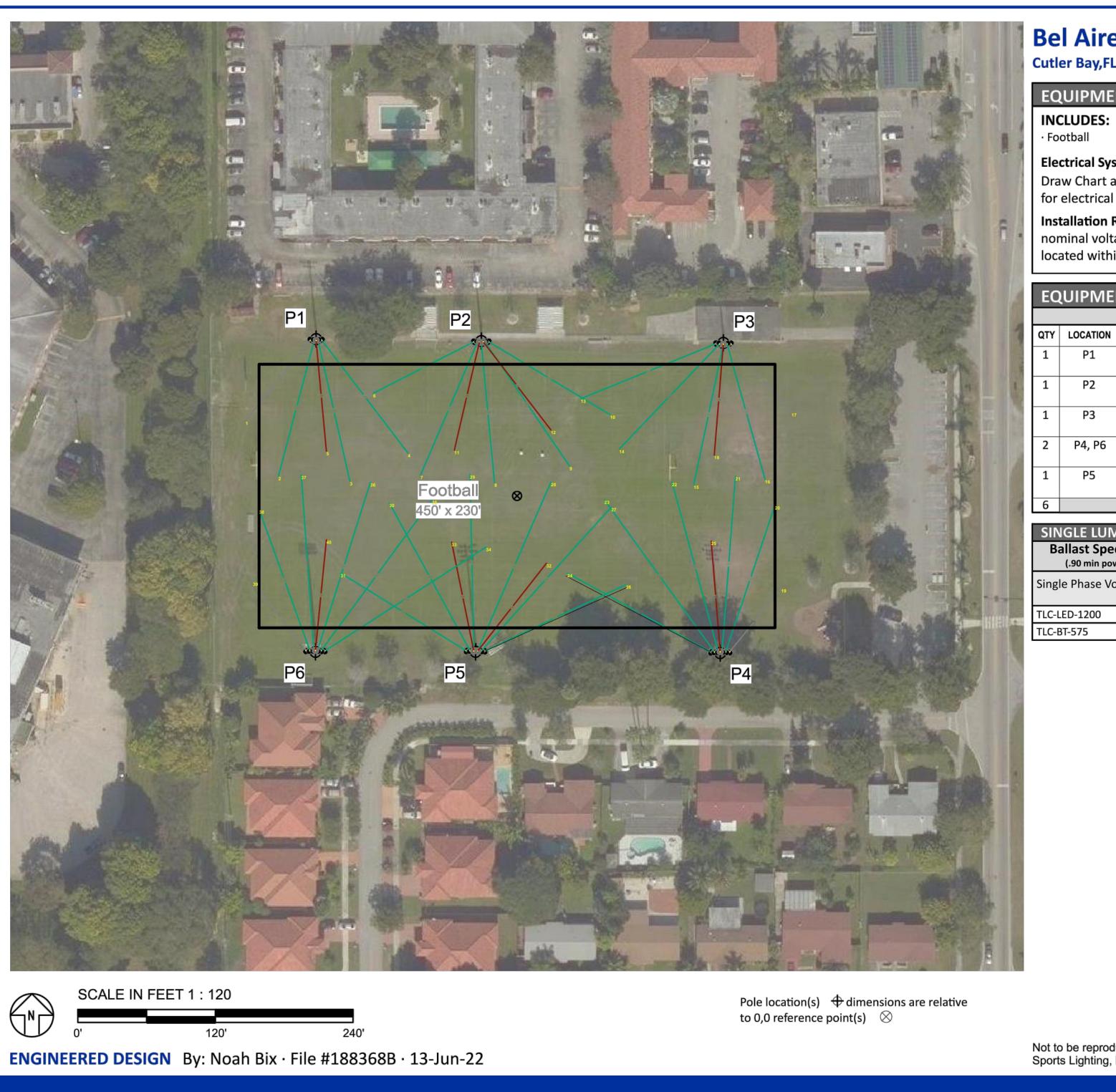
| I Spill<br>ove grade<br>ARY<br>Grid<br>5159<br>.07<br>31<br>7<br>MUUNINATION described<br>usco Warranty<br>ILLUMINATION described<br>usco Warranty<br>I field measurements may vary<br>ctions and should be taken<br>ts.<br>Refer to Amperage<br>Control System Summary"<br>Mts assume ± 3%<br>he driver and structures<br>sign locations.  |   |  |
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| AW<br>ILUMINATION described<br>usco Warranty<br>I field measurements may vary<br>ctions and should be taken<br>15.<br>* Refer to Amperage<br>Control System Summary"<br>Alts assume ± 3%<br>the driver and structures<br>sign locations.  | .07   |  |
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| ILLUMINATION described<br>usco Warranty<br>I field measurements may vary<br>ctions and should be taken<br>15.<br>: Refer to Amperage<br>Control System Summary"<br>Alts assume ± 3%<br>he driver and structures<br>sign locations.  |   |  |
| ILLUMINATION described<br>usco Warranty<br>I field measurements may vary<br>ctions and should be taken<br>15.<br>: Refer to Amperage<br>Control System Summary"<br>Alts assume ± 3%<br>he driver and structures<br>sign locations.  | ζW  |  |
| ctions and should be taken<br>15.<br>: Refer to Amperage<br>Control System Summary"<br>alts assume ± 3%<br>the driver and structures<br>sign locations.<br>Sign locations.<br>It happen.<br>t without the written consent of Musco<br>Musco Sports Lighting, LLC.   | ILLUMINATION described<br>usco Warranty                               |  |
| <ul> <li>Refer to Amperage</li> <li>Control System Summary"</li> <li>Alts assume ± 3%</li> <li>the driver and structures</li> <li>sign locations.</li> </ul>  | l field measurements may vary<br>ctions and should be taken           |  |
| the driver and structures<br>sign locations.  | : Refer to Amperage<br>Control System Summary"                        |  |
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| lusco Sports Lighting, LLC.   | <b>It Happen</b>  |  |
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| E PARK  |                          |                   |          |
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| S LIGHTING UPGRADES                               | Project No.              | LUMINATION SUN    | ////AR1  |
| CUTLER BAY, FLORIDA                               | 215618048<br>Drawing No. | NO SCALE<br>Sheet | Revision |
| VG DS BB NE 22.09.27<br>Dwn. Chkd. Dsgn. YY.MM.DD | E-705                    | 17 of 19          | 0        |

| 2022/12 | Revision                      |
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| DOCUMENTS. A CERTIFIED REPORT FROM AN E<br>CONTRACTOR LICENSED IN THE STATE OF FLC<br>MEETS THE APPROVED PLAN SHALL BE PROVI<br>CERTIFICATE OF COMPLETION AND/OR OCCUP | ORIDA TO<br>DED PRI | ) VERIFY              | ′ THAT THE | PHOTOMETRIC PLAN |                             |
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|  | <br><br><br><br>By  | <br><br><br><br>Appd. |            |                  | PERMIT<br>NOT TO BE USED FO |

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## **Bel Aire Park Football Retrofit** Cutler Bay,FL

#### EQUIPMENT LAYOUT

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

| EQUIPMENT LIST FOR AREAS SHOWN |          |       |                    |                    |                   |               |  |
|--------------------------------|----------|-------|--------------------|--------------------|-------------------|---------------|--|
|                                |          | Pole  |                    | Luminaires         |                   |               |  |
| QTY                            | LOCATION | CLASS | GRADE<br>ELEVATION | MOUNTING<br>HEIGHT | LUMINAIRE<br>TYPE | QTY /<br>POLE |  |
| 1                              | P1       |       | -                  | 15'                | TLC-BT-575        | 1             |  |
|                                |          |       |                    | 60'                | TLC-LED-1200      | 4             |  |
| 1                              | P2       |       | -                  | 15'                | TLC-BT-575        | 2             |  |
|                                |          |       |                    | 60'                | TLC-LED-1200      | 5             |  |
| 1                              | P3       |       | -                  | 15'                | TLC-BT-575        | 1             |  |
|                                |          |       |                    | 60'                | TLC-LED-1200      | 5             |  |
| 2                              | P4, P6   |       | -                  | 15'                | TLC-BT-575        | 1             |  |
|                                |          |       |                    | 80'                | TLC-LED-1200      | 6             |  |
| 1                              | P5       |       | -                  | 15'                | TLC-BT-575        | 2             |  |
|                                |          |       |                    | 80'                | TLC-LED-1200      | 6             |  |
| 6                              | TOTALS   |       |                    |                    |                   |               |  |

| SINGLE LUMINAIRE AMPERAGE DRAW CHART   |             |             |             |                    |                    |             |             |
|--|-------------|-------------|-------------|--------------------|--------------------|-------------|-------------|
| Ballast Specifications<br>(.90 min power factor) Line Amperage Per Luminaire<br>(max draw) |             |             |             |                    | 9                  |             |             |
| Single Phase Voltage   | 208<br>(60) | 220<br>(60) | 240<br>(60) | <b>277</b><br>(60) | <b>347</b><br>(60) | 380<br>(60) | 480<br>(60) |
| LC-LED-1200  | 7.0         | 6.6         | 6.1         | 5.2                | 4.2                | 4.0         | 3.0         |
| LC-BT-575  | 3.4         | 3.2         | 2.9         | 2.5                | 2.0                | 1.8         | 1.5         |
|  |             |             |             |                    |                    | -           |             |



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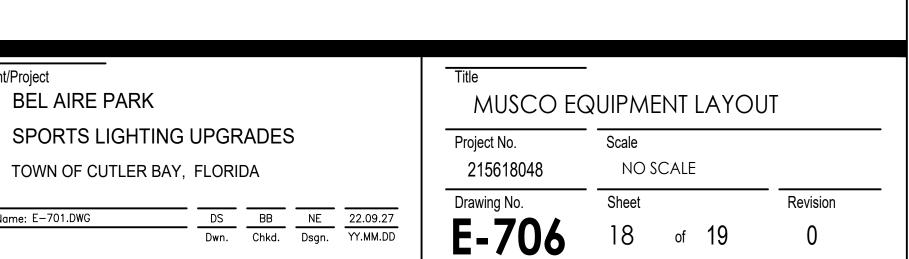


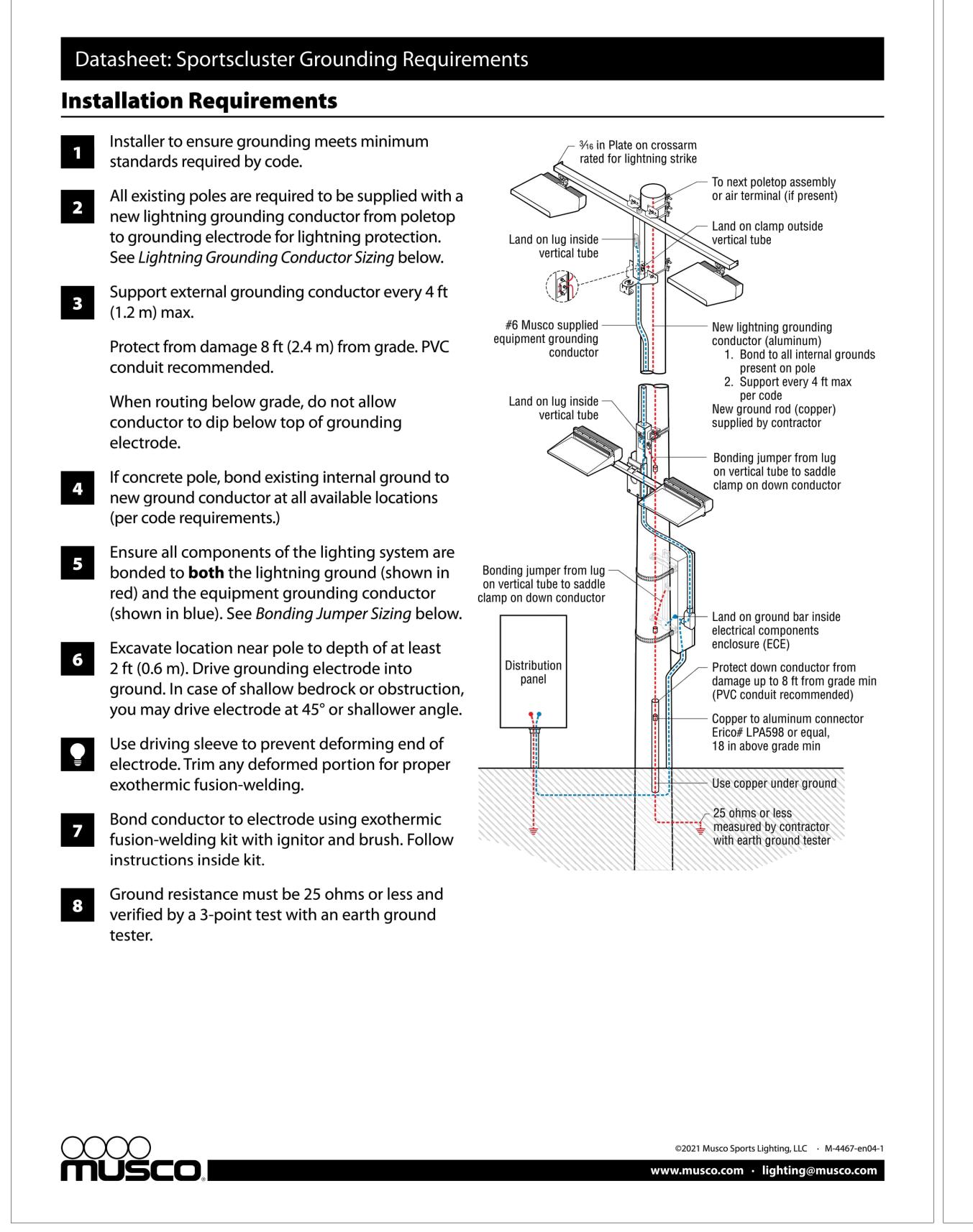
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Client/Project **BEL AIRE PARK** 

File Name: E—701.DWG





PERMIT SET NOT TO BE USED FOR CONSTRUCTION

ORIGINAL SHEET - ANSI D HORIZ

Revision

By Appd. YY.MM.DD

### Datasheet: Sportscluster Grounding Requirements

#### Lightning Grounding Conductor Sizing

Attach to external lightning grounding lug (rated for aluminum only) or to internal lightning grounding lug (dual-rated).

| Mounting Height    | Bare Stranded<br>Aluminum <sup>1</sup>                         | Bare Stranded<br>Copper <sup>2</sup>                          |
|--------------------|--|---|
| Up to 75 ft (23 m) | 1/0 AWG<br>(cross-sectional area<br>of 53.5 mm²)               | 2 AWG<br>(cross-sectional area<br>of 33.6 mm <sup>2</sup> )   |
| Over 75 ft (23 m)  | 4/0 AWG<br>(cross-sectional area<br>of 107.2 mm <sup>2</sup> ) | 2/0 AWG<br>(cross-sectional area<br>of 67.4 mm <sup>2</sup> ) |

1. Copper grounding conductor required for underground connection to grounding electrode. Use properly rated AL to CU connector.

2. If using copper for lightning, supply copper to aluminum adapters for clamps (rated for aluminum only).

#### **Bonding Jumper Sizing**

| Length        | Bare Aluminum          | Bare Copper            |
|---------------|------------------------|------------------------|
| < 6 ft (1.8m) | 4 AWG (cross-sectional | 6 AWG (cross-sectional |
|               | area of 21.2 mm2)      | area of 13.2 mm2)      |

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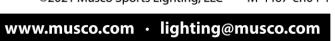
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Client/Project **BEL AIRE PARI** SPORTS LIGH TOWN OF CUTLEF

File Name: E—707.DWG



| ĸ                         | Title<br>MUSCO DA | ATA SHEETS |          |
|---------------------------|-------------------|------------|----------|
| TING UPGRADES             | Project No.       | Scale      |          |
| R BAY, FLORIDA            | 215618048         | NO SCALE   |          |
| DS BB NE 22.09.27         | Drawing No.       | Sheet      | Revision |
| Dwn. Chkd. Dsgn. YY.MM.DD |                   | 19 of 19   | 0        |