

TOWN OF CORNWALL BASEBALL FIELD LIGHTING 2019



Town of
Cornwall

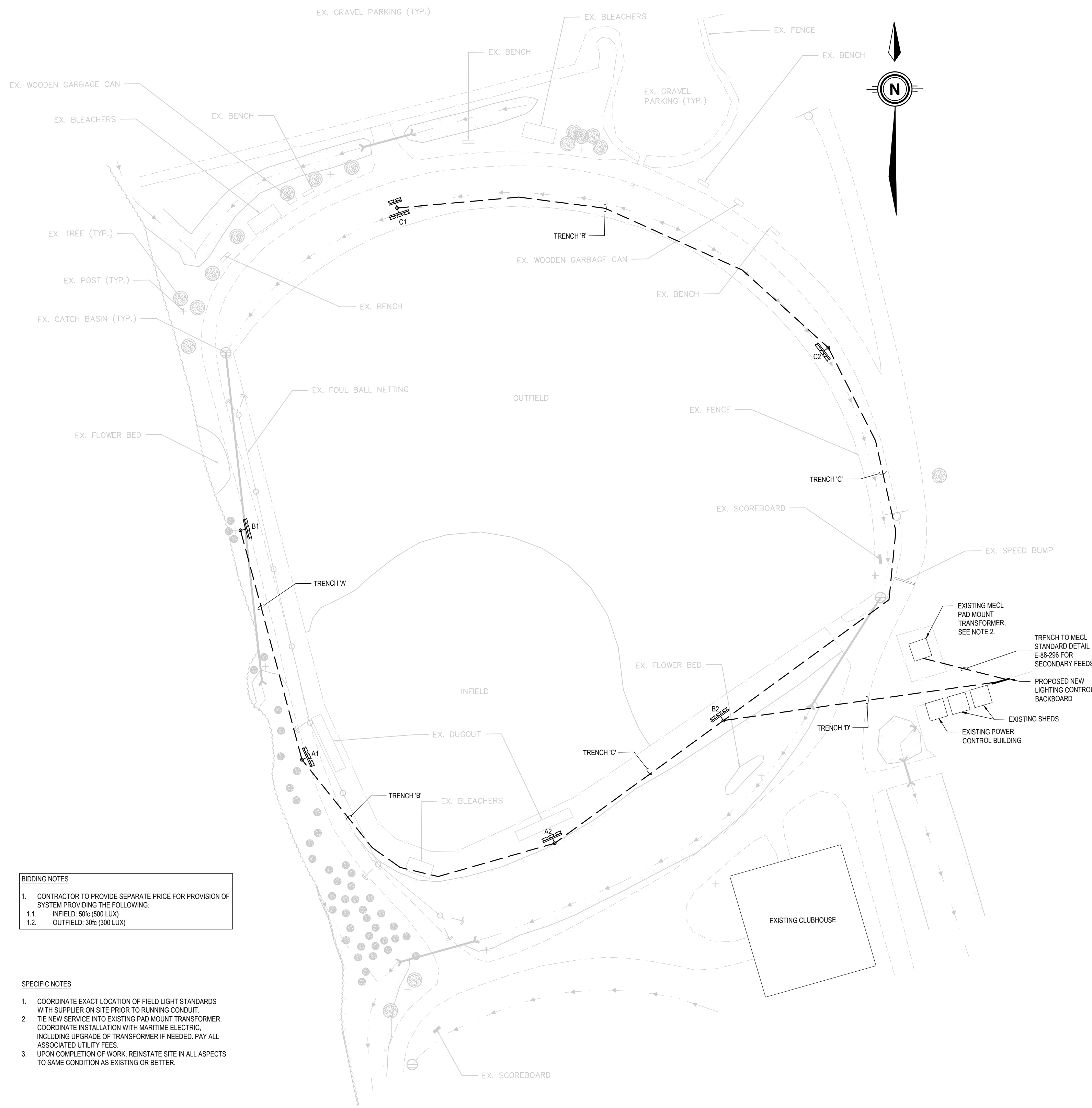
so much to offer...



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DECEMBER 2019

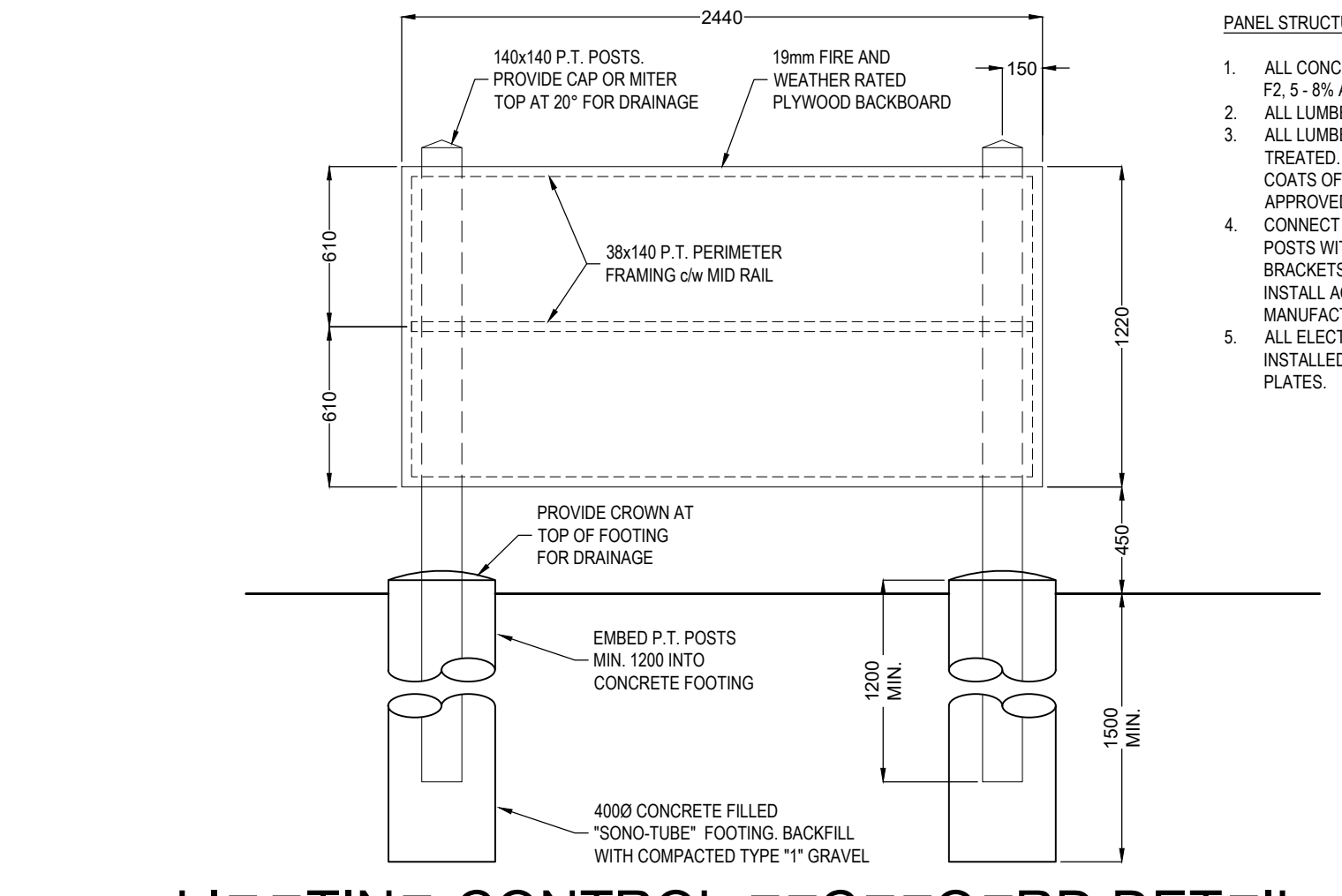


BIDDING NOTES

- CONTRACTOR TO PROVIDE SEPARATE PRICE FOR PROVISION OF SYSTEM PROVIDING THE FOLLOWING:
 - INFIELD: 50c (600 LUX)
 - OUTFIELD: 30c (300 LUX)

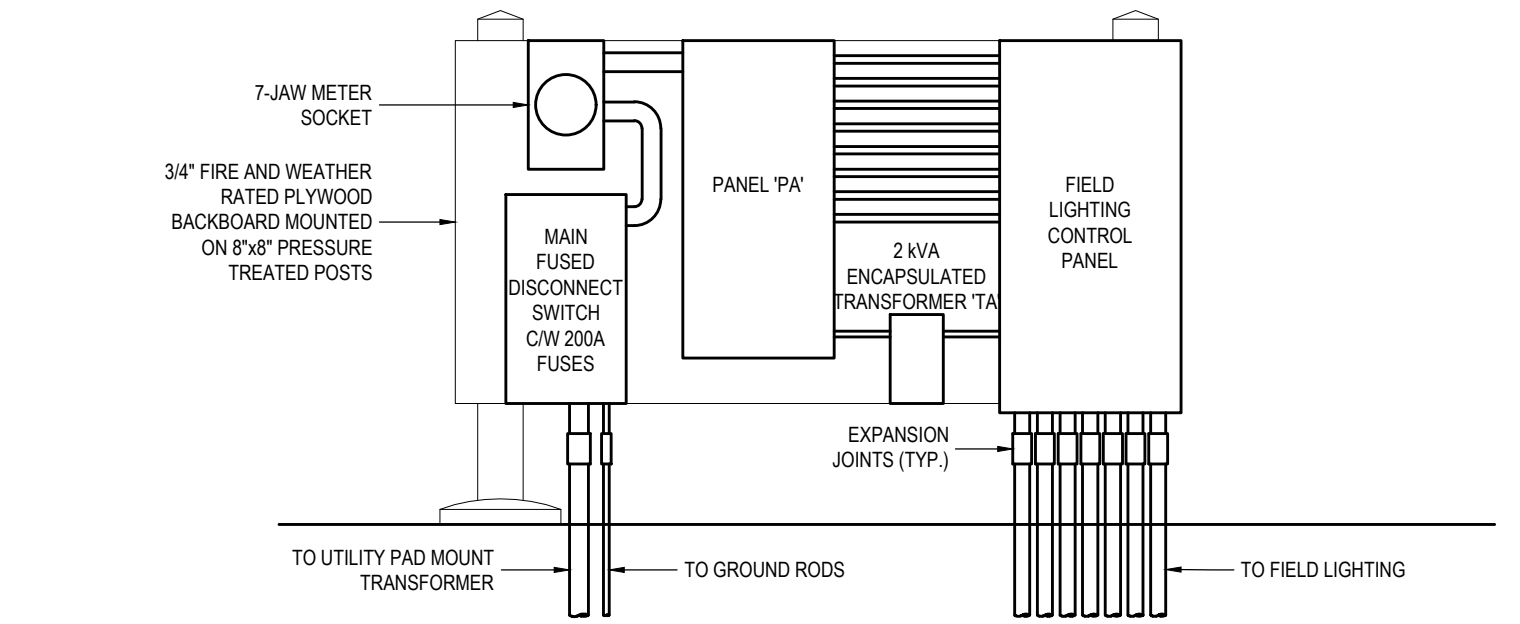
- SPECIFIC NOTES**
- COORDINATE EXACT LOCATION OF FIELD LIGHT STANDARDS WITH SUPPLIER ON SITE PRIOR TO RUNNING CONDUIT.
 - THE NEW SERVICE INTO EXISTING PAD MOUNT TRANSFORMER, COORDINATE INSTALLATION WITH MARITIME ELECTRIC, INCLUDING UPGRADE OF TRANSFORMER IF NEEDED. PAY ALL ASSOCIATED UTILITY FEES.
 - UPON COMPLETION OF WORK, REINSTATE SITE IN ALL ASPECTS TO SAME CONDITION AS EXISTING OR BETTER.

SITE PLAN
1:500



- PANEL STRUCTURE NOTES:**
- ALL CONCRETE SHALL BE 25 MPa CLASS F2.5 - 8% AIR ENTRAINMENT
 - ALL LUMBER TO BE SPF No. 1 OR BETTER
 - ALL LUMBER TO BE MCA PRESSURE TREATED. COAT ALL CUT ENDS WITH 2 COATS OF PENTOX PRESERVATIVE OR APPROVED EQUAL.
 - CONNECT ALL FRAMING TO TIMBER POSTS WITH SIMPSON A34 GALVANIZED BRACKETS OR APPROVED EQUAL. INSTALL ACCORDING TO MANUFACTURERS INSTRUCTIONS.
 - ALL ELECTRICAL PANELS TO BE INSTALLED WITH 38x89 P.T. BACKER PLATES.

LIGHTING CONTROL CABINET DETAIL
NTS



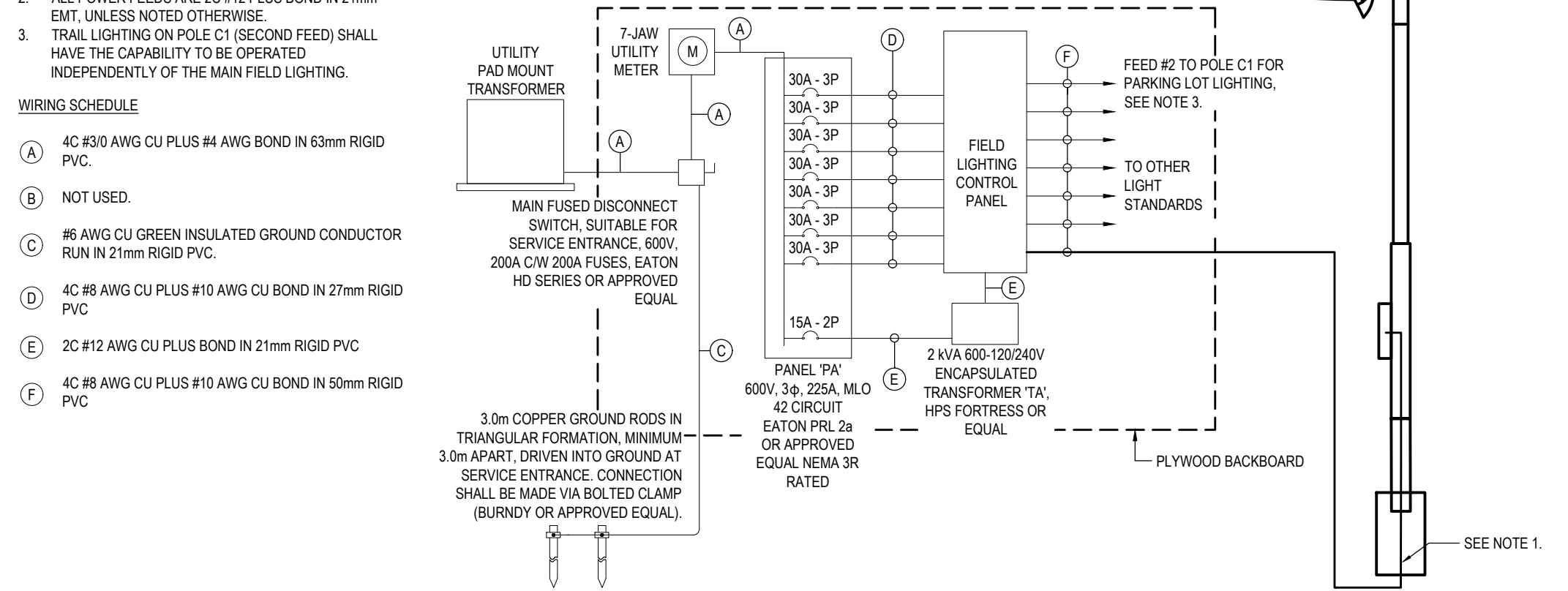
LIGHTING CONTROL ELEVATION
NTS

SPECIFIC NOTES

- RUN CONDUIT AND WIRING UP TO LUMINAIRE BASE. RUN WIRING UP TO POLE MOUNTED ELECTRICAL ENCLOSURE. COORDINATE EXACT ROUTING WITH LUMINAIRE INSTALLER.
- ALL POWER FEEDS ARE 2C #12 PLUS BOND IN 21mm EMT, UNLESS NOTED OTHERWISE.
- TRAIL LIGHTING ON POLE C1 (SECOND FEED) SHALL HAVE THE CAPABILITY TO BE OPERATED INDEPENDENTLY OF THE MAIN FIELD LIGHTING.

WIRING SCHEDULE

- (A) 4C #10 AWG CU PLUS #4 AWG BOND IN 63mm RIGID PVC
- (B) NOT USED
- (C) #6 AWG CU GREEN INSULATED GROUND CONDUCTOR RUN IN 21mm RIGID PVC
- (D) 4C #8 AWG CU PLUS #10 AWG BOND IN 27mm RIGID PVC
- (E) 2C #12 AWG CU PLUS BOND IN 21mm RIGID PVC
- (F) 4C #8 AWG CU PLUS #10 AWG BOND IN 50mm RIGID PVC



POWER RISER SCHEMATIC
NTS

NOTES:

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REVISION:

NO.	DATE	ISSUED FOR TENDER	DESCRIPTION	DATE: (YYYY/MM/DD)
0	2019/12/04	ISSUED FOR TENDER		2019/05/23

PROJECT NUMBER: 191-08666
 ORIGINAL SCALE: HORIZONTAL: 1:500 VERTICAL: N/A
 DESIGNED BY: C. BOURQUE
 DRAWN BY: M. KAMPHUIS

SCALE: 1:500 METRIC

wsp

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CLIENT: TOWN OF CORNWALL

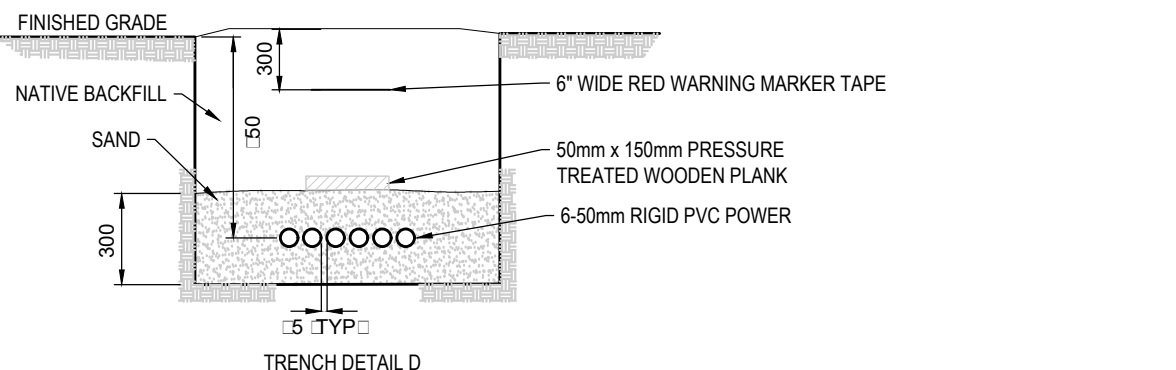
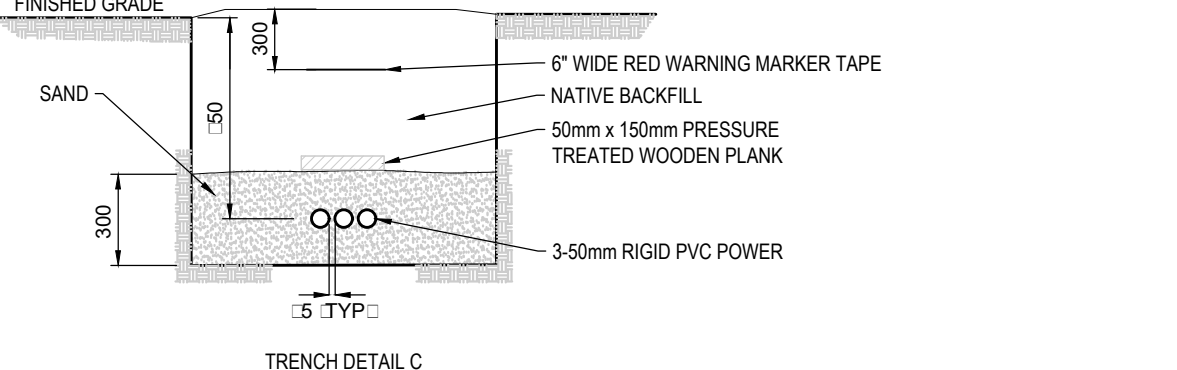
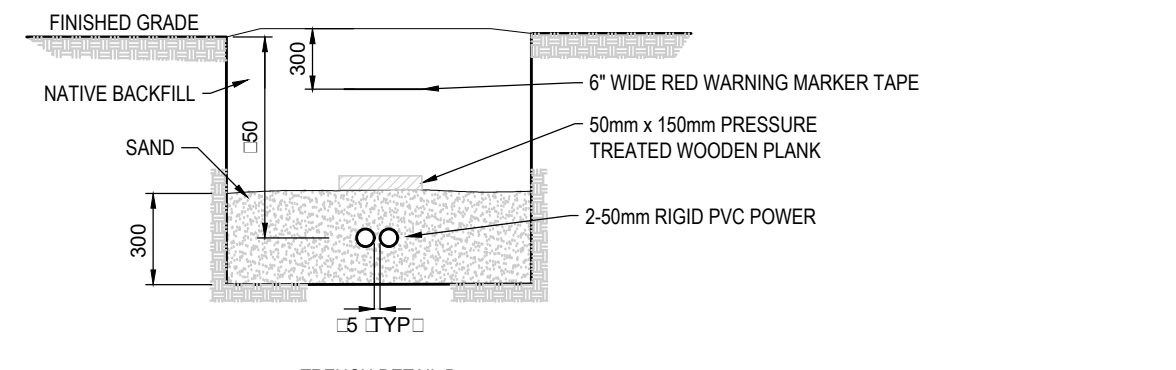
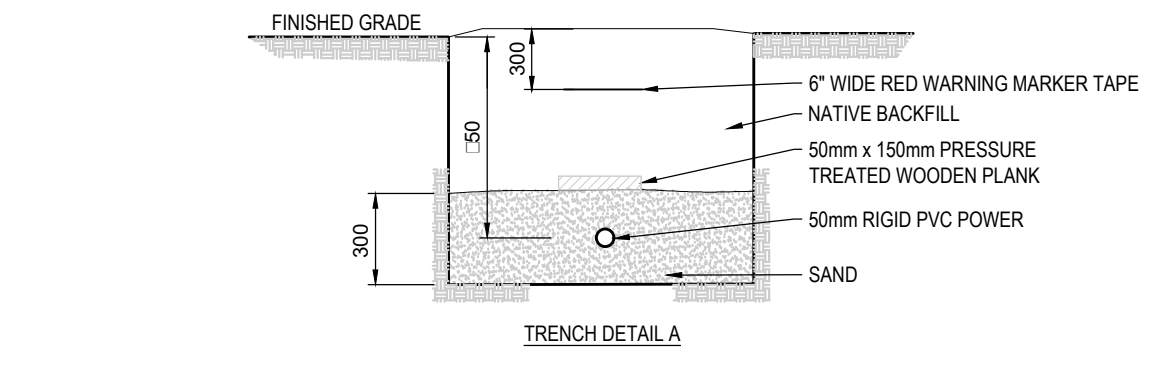
CLIENT REF. #: BASEBALL FIELD LIGHTING

PROJECT: TOWN OF CORNWALL BASEBALL FIELD LIGHTING CORNWALL, PE

TITLE: SITE PLAN AND DETAILS TERRY FOX BASEBALL FIELD

SHEET NUMBER: E01

SHEET #: 1 OF 2



EXISTING TRENCH DETAILS
NTS

BY: MATTHEW KAMPHUIS E01 PRINTED: 4:20 PM 2019/12/03

9 GENERAL REQUIREMENTS

EXAMINATION OF THE SITE AND CONDITIONS
1) EXAMINE THE SITE AND LOCAL CONDITIONS AFFECTING THE WORK WITH ALL TENDER DOCUMENTS, TO ENSURE THE WORK CAN BE SATISFACTORILY PERFORMED AS SHOWN PRIOR TO COMMENCING WORK. EXAMINE THE WORK OF OTHER DIVISIONS AND REPORT AT ONCE ANY DEFECT OR INTERFERENCE AFFECTING THE WORK OF THIS CONTRACTOR. NO ALLOWANCE WILL BE MADE LATER FOR ANY EXPENSES INCURRED THROUGH FAILURE TO MAKE THIS EXAMINATION OR TO REPORT ANY DISCREPANCIES IN WRITING.
2) THIS CONTRACTOR IS TO ATTEND ALL SITE MEETINGS PRIOR TO CLOSE OF TENDER TO CONFIRM SCOPE OF WORK.

BY-LAW AND REGULATIONS
1) CONFORM WITH LATEST RULES, REGULATIONS AND DEFINITIONS OF THE CANADIAN ELECTRICAL CODE, APPLICABLE MUNICIPAL AND PROVINCIAL CODES AND REGULATIONS AND WITH REQUIREMENTS OF OTHER AUTHORITIES HAVING JURISDICTION IN THE AREA WHERE WORK IS TO BE PERFORMED.
2) STANDARDS ESTABLISHED BY DRAWINGS AND SPECIFICATIONS SHALL NOT BE REDUCED BY ANY CODES, REGULATIONS OR ORDINANCES REQUIRING BY AN AUTHORITY HAVING JURISDICTION SHALL BE PERFORMED WITHOUT CHANGE TO THE CONTRACT AMOUNT.

SAFETY REQUIREMENTS
1) CLEAN SITE AT REGULARLY SCHEDULED TIMES. LEAVE WORK CLEAN BEFORE INSPECTION PROCESS COMMENCES.
2) DO NOT LEAVE THE SITE IN DANGEROUS CONDITIONS, UNDER ANY CIRCUMSTANCES, DURING THE PROGRESS OF WORK.

CO-OPERATION AND RESPONSIBILITY
1) INCLUDE FULL RESPONSIBILITY FOR LAYOUT OF ELECTRICAL WORK, FOR DAMAGE CAUSED TO OTHER DIVISIONS OF WORK BY REASON OF IMPROPER LOCATION OR INSTALLATION OF WORK IN ADVANCE OF CONCRETE POURING OR SIMILAR WORK, FOR CONDITIONS OF ALL MATERIALS AND EQUIPMENT UNDER THIS DIVISION AND FOR PROTECTION AND MAINTENANCE OF WORK COMPLETED AND ACCEPTED UNITS.
2) CO-OPERATE WITH OTHER DIVISIONS TO ENSURE THAT ITEMS INSTALLED UNDER THIS DIVISION ARE LOCATED IN PROPER RELATION WITH BUILDING CONSTRUCTION, ARCHITECTURAL FINISHES AND WITH OTHER EQUIPMENT OR APPARATUS.

PERMITS FEES AND CERTIFICATES
1) FILE CONTRACT DRAWINGS WITH PROPER AUTHORITIES AND OBTAIN APPROVAL OF INSTALLATION AND PERMITS FOR THE WORK. PREPARE AND SUBMIT NECESSARY DETAIL SHOP DRAWINGS AS REQUIRED BY AUTHORITIES.
2) PAY ALL FEES IN CONNECTION WITH EXAMINATION OF DRAWINGS, FOR PERMITS, INSPECTIONS AND FINAL CERTIFICATES OF APPROVAL.
3) SUPPLY NECESSARY CERTIFICATES AS EVIDENCE THAT WORK AS INSTALLED CONFORMS WITH LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

EQUIPMENT SHOP DRAWINGS
1) PREPARE AND SUBMIT VIA EMAIL A PDF OF SHOP DRAWINGS OF ALL MAJOR ITEMS OF EQUIPMENT PRIOR TO EQUIPMENT FABRICATION, DELIVERY OR INSTALLATION. SHOP DRAWINGS SHALL INDICATE MANUFACTURER, CATALOGUE NUMBER, DIMENSIONS, SPECIAL FEATURES OR FINISHES.
2) SUBMIT SHOP DRAWING WITHIN (7) DAYS OF AWARD OF CONTRACT.
3) THE OWNER RESERVES THE RIGHT TO WAIVE APPROVAL DRAWINGS AND ACCEPT RECORD DRAWINGS, THIS IN NO WAY RELIEVES THE CONTRACTOR FROM SUPPLYING THE SPECIFIC EQUIPMENT.
4) THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL SHOP DRAWINGS FOR ERRORS OR OMISSIONS TO CONFORM WITH ACCURACY REQUIREMENTS OF DIMENSIONS TO CONFORM WITH SITE CONDITIONS AND FOR INFORMATION THAT PERTAINS SOLELY TO EQUIPMENT FABRICATION PROCESSES.

AS BUILT DRAWINGS
1) THE CONTRACTOR SHALL MAINTAIN ON SITE ONE SET OF UP TO DATE AS BUILT DRAWINGS FOR REVIEW AT ALL TIMES. AT THE END OF THIS CONTRACT THE CONTRACTOR SHALL SUPPLY THE OWNER A COMPLETE SET OF AS BUILT DRAWINGS FOR HIS REVIEW AND ACCEPTANCE.

COMPLETION
1) LEAVE ALL NEW AND RELOCATED EQUIPMENT CLEAN, FREE OF CONSTRUCTION DEBRIS AND OTHER FOREIGN MATTER. REMOVE ANY TEMPORARY OR PROTECTIVE COATINGS.
2) UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL PROVIDE IN A TIMELY FASHION AS BUILT DRAWINGS, LETTER OF WARRANTY, OWNERS MANUAL AND WORKERS COMPENSATION CLEARANCE CERTIFICATE.

EQUIPMENT LOCATIONS
1) THE RIGHT IS RESERVED TO ALTER THE LOCATION OF EQUIPMENT AND OUTLETS AT DISTANCE OF UP TO TEN FEET (3 METERS) WITHOUT INVOLVING A CHANGE TO THE CONTRACT AMOUNT. PROVIDED NOTICE IS GIVEN PRIOR TO INSTALLATION OF SAME.

CONTRACT DRAWINGS
1) THESE DRAWINGS ARE INTENDED TO SERVE AS A GUIDE SHOWING QUANTITIES AND GENERAL ARRANGEMENTS AND ARE NOT NECESSARILY WORKING DRAWINGS FROM WHICH MEASUREMENTS CAN BE TAKEN. EXCEPT WHERE DIMENSION FIGURES ARE SPECIFICALLY SHOWN, INFORMATION INVOLVING ACCURATE MEASUREMENTS OF BUILDINGS SHALL BE TAKEN FROM BUILDING DRAWINGS OR FROM THE SITE.

MATERIAL
1) MATERIALS SUPPLIED BY THIS CONTRACTOR SHALL BE NEW, OF CANADIAN MANUFACTURE WHERE AVAILABLE AND OF FIRST QUALITY AND UNIFORM THROUGHOUT.
2) ALL ELECTRICAL MATERIALS SHALL BE CSA APPROVED AND LABELED AND ALL MATERIALS NOT APPROVED SHALL RECEIVE ACCEPTANCE FOR INSTALLATION BY SPECIAL APPLICATION TO CSA. MATERIAL SHALL NOT BE INSTALLED OR CONNECTED TO A SOURCE OF ELECTRICAL POWER UNTIL APPROVAL IS OBTAINED.

- 14. USE CSA APPROVED LUBRICANTS OF TYPE COMPATIBLE WITH CABLE JACKET TO REDUCE PULLING TENSION.
15. TO FACILITATE MATCHING OF COLOUR CODED MULTI CONDUCTOR CONTROL CABLES REEL OFF IN SAME DIRECTION DURING INSTALLATION.
16. BEFORE PULLING CABLE INTO DUCTS AND UNTIL CABLES ARE PROPERLY TERMINATED SEAL ENDS OF NON-LEADED CABLES WITH MOISTURE SEAL TAPE.
17. AFTER INSTALLATION OF CABLES, SEAL DUCT ENDS WITH DUCT SEALING COMPOUND.

- 2. TESTING
2.1. PERFORM TESTS USING QUALIFIED PERSONNEL. PROVIDE NECESSARY INSTRUMENTS AND EQUIPMENT.
2.2. CHECK PHASE ROTATION AND IDENTIFY EACH PHASE CONDUCTOR OF EACH FEEDER.
2.3. CHECK EACH FEEDER FOR CONTINUITY, SHORT CIRCUITS AND GROUNDS. ENSURE RESISTANCE TO GROUND OF CIRCUITS IS NOT LESS THAN 50 MEGOHMS.
2.4. PRE-ACCEPTANCE TESTS
2.4.1. AFTER INSTALLING CABLE BUT BEFORE SPLICING AND TERMINATING, PERFORM ISOLATION RESISTANCE TEST WITH 600 V MEGGER ON EACH PHASE CONDUCTOR.
2.4.2. CHECK INSULATION RESISTANCE AT EACH TERMINATION TO ENSURE THAT CABLE SYSTEM IS READY FOR ACCEPTANCE TESTING.
2.5. ACCEPTANCE TESTS
2.5.1. ENSURE THAT TERMINATIONS AND ACCESSORY EQUIPMENT ARE DISCONNECTED.
2.5.2. GROUND SHIELDS, GROUND WIRES, METALLIC ARMOUR AND CONDUCTORS NOT UNDER TEST.
2.6. PROVIDE ENGINEER WITH LIST OF TEST RESULTS SHOWING LOCATION AT WHICH EACH TEST WAS MADE, CIRCUIT TESTED AND RESULT OF EACH TEST.
2.7. REMOVE AND REPLACE ENTIRE LENGTH OF CABLE IF CABLE FAILS TO MEET ANY OF THE TEST CRITERIA.
2.8. FAILURE TO PROVIDE TEST RESULTS WILL DELAY PROGRESS BILLING.

26 05 44 - DIRECT BURIED UNDERGROUND CONDUITS
TABLE WITH 4 COLUMNS: AREA OF LIGHTING, ILLUMINATION LEVELS, MINIMUM UNIFORMITY RATIO, GRID POINTS SPACING

- PRODUCTS
1. PVC DUCTS
1.1. RIGID PVC CONDUITS: SIZE AS INDICATED, NOMINAL LENGTH OF 3 METRES.
1.2. RIGID PVC COUPLINGS, REDUCERS, BELL END FITTINGS, PULS, CAPS, ADAPTORS AS REQUIRED TO MAKE COMPLETE INSTALLATION.
1.3. RIGID PVC 90 AND 45 BENDS AS REQUIRED.
1.4. RIGID PVC S ANGLE COUPLINGS AS REQUIRED.
1.5. EXPANSION JOINTS AS REQUIRED.
2. SOLVENT
2.1. SOLVENT WELD COMPOUND FOR PVC DUCT JOINTS.
3. CABLE PULLING EQUIPMENT
3.1. 6.5MM STRANDED NYLON PULL ROPE TENSILE SKN.
4. MARKING TAPE
4.1. 150MM WIDE, RED, POLYETHYLENE MARKED 'BURIED ELECTRIC LINE'.
4.1.1. STANDARD OF ACCEPTANCE: THOMAS AND BETTS NA TYPE.

- EXECUTION
6. INSTALLATION
6.1. INSTALL PVC DUCT AS INDICATED AND IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
6.2. CLEAN INSIDE OF DUCTS BEFORE LAYING.
6.3. ENSURE FULL EVEN SUPPORT EVERY 1500MM THROUGHOUT DUCT LENGTH.
6.4. SLOPE DUCTS AWAY FROM CABINET AND POLE WITH 1 TO 400 MINIMUM SLOPE. PUNCH A SMALL HOLE IN BOTTOM OF DUCTS AT LOW POINT.
6.5. PROVIDE SLEEVE FOR DUCTS PASSING THROUGH FOOTINGS.
6.6. DURING CONSTRUCTION, CAP ENDS OF DUCTS TO PREVENT ENTRANCE OF FOREIGN MATERIALS.
6.7. PULL THROUGH EACH DUCT A STEEL MANDREL, NOT LESS THAN 300MM LONG AND OF A DIAMETER 60MM LESS THAN INTERNAL DIAMETER OF DUCT, FOLLOWED BY STIFF BRISTLE BRUSH TO REMOVE SAND, EARTH AND OTHER FOREIGN MATTER, PUFF STIFF BRISTLE BRUSH THROUGH EACH DUCT IMMEDIATELY BEFORE PULLING IN CABLES.
6.8. IN EACH DUCT INSTALL PULL ROPE CONTINUOUS THROUGHOUT EACH DUCT RUN WITH 5 METRES OF SPARE ROPE AT EACH END.
6.9. INSTALL MARKING TAPE 150MM BELOW FINISHED GRADE ALONG THE COMPLETE LENGTH OF BURIED DUCT AS INDICATED.

- 26 24 16 PANELBOARDS AND BREAKER TYPE
PART 2 - PRODUCTS
21 SPORTS LIGHTING SYSTEM CONSTRUCTION
A. MANUFACTURING REQUIREMENTS: ALL COMPONENTS SHALL BE DESIGNED AND MANUFACTURED AS A SYSTEM. ALL LUMINAIRES, WIRE HARNESES, BALLAST AND OTHER ENCLOSURES SHALL BE FACTORY ASSEMBLED, ARMED, 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 OF 18-8 GRADE OR BETTER, PASSIVATED AND COATED WITH ALUMINUM-BASED THERMOSETTING 'POXY' RESIN FOR PROTECTION AGAINST CORROSION AND STRESS CORROSION CRACKING. STRUCTURAL FASTENERS MAY BE CARBON STEEL AND GALVANIZED MEETING ASTM A153 AND ISOEN 1461 (FOR HOT DIPPED GALVANIZING), OR ASTM B895 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:
1. GALVANIZED STEEL POLES AND CROSS-ARM ASSEMBLIES.
2. NON-APPROVED POLE TECHNOLOGY.
a. SQUARE STATIC CAST CONCRETE POLES WILL NOT BE ACCEPTED.
b. DIRECT BURY STEEL POLES WHICH UTILIZE THE EXTENDED PORTION OF THE STEEL SHAFT FOR THEIR FOUNDATION WILL NOT BE ACCEPTED DUE TO POTENTIAL FOR INTERNAL AND EXTERNAL CORROSION REACTION TO THE SOILS AND LONG-TERM PERFORMANCE CONCERNS.
3. PRE-STRESSED CONCRETE BASE EMBEDDED IN CONCRETE BACKFILL ALLOWED TO CURE FOR 12-24 HOURS BEFORE POLE STRESS IS APPLIED. ALTERNATE MAY BE AN ANCHOR BOLT FOUNDATION DESIGNED SUCH THAT THE STEEL POLE AND ANY EXPOSED STEEL PORTION OF THE FOUNDATION IS LOCATED A MINIMUM OF 18 INCHES ABOVE FINAL GRADE AND CONCRETE FOR ANCHOR BOLT FOUNDATIONS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 28 DAYS BEFORE THE POLE STRESS IS APPLIED USING SHORTER CURE TIME APPROVED BY STRUCTURAL ENGINEER OF RECORD.
4. ALL LUMINAIRES SHALL BE CONSTRUCTED WITH A DIE-CAST ALUMINUM HOUSING OR EXTERNAL HAIL SHROUD TO PROTECT THE LUMINAIRE REFLECTOR SYSTEM.
5. MANUFACTURER WILL REMOVE ALL BALLASTS AND SUPPORTING ELECTRICAL EQUIPMENT IN ALUMINUM ENCLOSURES MOUNTED APPROXIMATELY 10 FEET ABOVE GRADE. THE ENCLOSURES SHALL BE TIGHTLY CLOSED AND INCLUDE BALLAST CAPACITOR 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 LOCATED IN THE ENCLOSURE. INTEGRAL BALLAST FUSES WILL NOT BE ACCEPTED.
6. WIRE HARNESS COMPLETE WITH AN ABRASION PROTECTION SHEATH, STRAIN RELIEF AND PLUG-IN CONNECTIONS FOR FAST, TROUBLE-FREE INSTALLATION.
7. ALL LUMINAIRES, VISORS, AND CROSS-ARM ASSEMBLIES SHALL WITHSTAND 150 MPH WINDS AND MAINTAIN STRENGTH UNDER WIND LOADS.
8. CONTROL CABINET TO PROVIDE REMOTE ON-OFF CONTROL AND MONITORING OF THE LIGHTING SYSTEM. CABINET SHALL BE CONSTRUCTED OF ALUMINUM AND BE RATED NEMA TYPE 4. COMMUNICATION METHOD SHALL BE PROVIDED BY MANUFACTURER. CABINET SHALL CONTAIN CONFIGURED CONTACTOR MODULES FOR 30, 60, AND 100 AMPS, LABELED TO MATCH FIELD DIAGRAMS AND ELECTRICAL DESIGN. MANUAL OFF-ON-AUTO SELECTOR SWITCHES SHALL BE PROVIDED.
9. LIGHTNING PROTECTION: MANUFACTURER SHALL PROVIDE INTEGRATED LIGHTNING PROTECTION VIA CONCRETE ENCASED ELECTRODE GROUNDING SYSTEM AS DEFINED BY NFPA 780 AND BE UL LISTED PER UL 96 AND UL 96A. IF GROUNDING IS NOT INTEGRATED INTO THE STRUCTURE, THE MANUFACTURER SHALL SUPPLY GROUNDING ELECTRODES: COPPER DOWN CONDUCTORS, AND DIE-CAST WELDED KITS. ELECTRODES AND CONDUCTORS SHALL BE SIZED AS REQUIRED BY NFPA 780.

- EXECUTION
1.1. CABLE INSTALLATION IN DUCTS
A. WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS SHALL CONFORM TO THE CONTRACT DOCUMENTS, ENGINEERING PLANS AS WELL AS PROVINCIAL AND LOCAL CODES.
B. THE PURPOSE OF THESE SPECIFICATIONS IS TO DEFINE THE LIGHTING SYSTEM

- SECTION 26 56 09 - 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 PROVINCIAL AND LOCAL CODES.
B. THE PURPOSE OF THESE SPECIFICATIONS IS TO DEFINE THE LIGHTING SYSTEM

PERFORMANCE AND DESIGN STANDARDS FOR THE PROJECT. THE MANUFACTURER/CONTRACTOR SHALL SUPPLY A LIGHTING SYSTEM TO MEET OR EXCEED THE STANDARDS SET FORTH IN THESE SPECIFICATIONS.
C. THE SPORTS LIGHTING WILL BE FOR THE FOLLOWING FIELDS:
1. BASEBALL FIELD
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 OVER A PERIOD OF 10 YEARS.
2. LIFE-CYCLE COST: 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.
3. CONTROL AND MONITORING: TO ALLOW FOR OPTIMIZED USE OF LABOUR 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 THE 10-YEAR PERIOD SHALL BE INCLUDED IN THE BID.
4. ENVIRONMENTAL LIGHT CONTROL: IT IS THE PRIMARY GOAL OF THIS PROJECT TO MINIMIZE SPILL LIGHT TO ADJACENT PROPERTIES AND GLARE TO THE PLAYERS, SPECTATORS AND NEIGHBOURS.

TABLE WITH 4 COLUMNS: AREA OF LIGHTING, ILLUMINATION LEVELS, MINIMUM UNIFORMITY RATIO, GRID POINTS SPACING

12 LIGHTING PERFORMANCE
A. PERFORMANCE REQUIREMENTS: 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. AVERAGE ILLUMINATION LEVEL SHALL BE MEASURED IN ACCORDANCE WITH THE IESNA LM-64-04 (IESNA GUIDE FOR PHOTOMETRIC MEASUREMENTS) AND THE IESNA LM-79-02 (IESNA GUIDE FOR ILLUMINATION LEVELS SHALL NOT DROP BELOW DESIRED TARGET VALUES IN ACCORDANCE TO IES RP-8-15, PAGE 2, MAINTAINED AVERAGE ILLUMINANCE AND SHALL BE GUARANTEED FOR THE FULL WARRANTY PERIOD.
OF POLES
A.1, A2, C1, C2
B1, B2
80'-0"

13 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.
B. THE FIRST PAGE OF A PHOTOMETRIC REPORT FOR ALL LUMINAIRE TYPES PROPOSED SHOWING HORIZONTAL AND VERTICAL ANGLE POWER SHOULD BE PROVIDED TO DEMONSTRATE THE CAPABILITY OF ACHIEVING THE SPECIFIED PERFORMANCE. REPORTS SHALL BE CERTIFIED BY A QUALIFIED INDEPENDENT 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.

14 LIFE CYCLE COSTS
A. MANUFACTURER SHALL SUBMIT 10-YEAR LIFE CYCLE COST CALCULATION AS OUTLINED IN THE REQUIRED SUBMITTAL INFORMATION. LAMP REPLACEMENT SCHEDULE PER CHARTS BELOW.
LAMP REPLACEMENT
5,000 HOUR INTERVALS
B. PREVENTATIVE AND SPOT MAINTENANCE: MANUFACTURER SHALL PROVIDE ALL PREVENTATIVE AND SPOT MAINTENANCE, INCLUDING PARTS AND LABOR FOR 10 YEARS FROM THE DATE OF EQUIPMENT SHIPMENT. INDIVIDUAL OUTAGES SHALL BE REPAIRED WHEN THE USAGE OF ANY FIELD IS MATERIALLY IMPACTED. OWNER AGREES TO CHECK FUSES IN THE EVENT OF A LUMINAIRE OUTAGE.

3.1 SOIL QUALITY CONTROL
A. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER IF SOIL CONDITIONS EXIST OTHER THAN THOSE ON WHICH THE FOUNDATION DESIGN IS BASED, OR IF THE SOIL CANNOT BE REMEDIATELY EXCAVATED. CONTRACTOR MAY ISSUE A CHANGE ORDER REQUEST / ESTIMATE FOR THE OWNER'S APPROVAL / PAYMENT FOR ADDITIONAL CONSTRUCTION OF FOUNDATION. FOUNDATIONS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 28 DAYS BEFORE THE POLE STRESS IS APPLIED USING SHORTER CURE TIME APPROVED BY STRUCTURAL ENGINEER OF RECORD.
2. ADDITIONAL MATERIALS REQUIRED TO ACHIEVE ALTERNATE FOUNDATION:
3. EXCAVATION AND REMOVAL OF MATERIALS OTHER THAN NORMAL SOILS, SUCH AS ROCK, CALICHE, ETC.
3.2 DELIVERY TIMING
A. DELIVERY TIMING EQUIPMENT ON-SITE: THE EQUIPMENT MUST BE ON-SITE 4-6 WEEKS PRIOR TO SUBMITTAL OF APPROVED SUBMITTALS AND RECEIPT OF COMPLETE ORDER INFORMATION.
3.3 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 IESNA LM-64 FOR LIGHTING METHOD 1. TYPED POWER ADJUSTMENT SYSTEMS, LIGHT LEVELS MUST BE MEASURED AND EXCEED THE SPECIFIED TARGET LEVELS. FOR LIGHTING METHOD 2, LIGHT LEVELS MUST BE MEASURED AND MEET THE SPECIFIED INITIAL LIGHT LEVEL.
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.
2. THE CONTRACTOR/MANUFACTURER SHALL BE RESPONSIBLE FOR AN ADDITIONAL INSPECTION ONE YEAR FROM THE DATE OF COMMISSIONING OF THE LIGHTING SYSTEM AND WILL UTILIZE THE OWNERS LIGHT METER IN THE PRESENCE OF THE

THE GROUNDING ELECTRODE SHALL BE MINIMUM SIZE OF 5/8 INCH DIAMETER AND 8 FEET LONG WITH A MINIMUM OF 10 FEET EMBEDMENT. GROUNDING ELECTRODE SHALL BE CONNECTED TO THE STRUCTURE BY A GROUNDING ELECTRODE CONDUCTOR WITH A MINIMUM SIZE OF 2 AWG FOR POLES WITH 75 FEET MOUNTING HEIGHT OR LESS, AND 2/0 AWG FOR POLES WITH MORE THAN 75 FEET MOUNTING HEIGHT.
10. ENHANCED CORROSION PROTECTION PACKAGE: DUE TO THE POTENTIALLY CORROSIVE ENVIRONMENT FOR THIS PROJECT, MANUFACTURERS MUST PROVIDE DOCUMENTATION THAT THEIR PRODUCTS MEET THE FOLLOWING ENHANCED REQUIREMENTS IN ADDITION TO THE STANDARD DURABILITY PROTECTION SPECIFIED ABOVE:
a) EXPOSED CARBON STEEL HORIZONTAL SURFACES ON THE CROSSARM ASSEMBLY SHALL BE GALVANIZED TO NO LESS THAN A FIVE (5) MIL AVERAGE THICKNESS.
b) EXPOSED DIE-CAST ALUMINUM COMPONENTS SHALL BE TYPE I ANODIZED PER MIL-STD-8825 AND COATED WITH HIGH PERFORMANCE POLYESTER.
c) EXPOSED EXTRUDED ALUMINUM COMPONENTS SHALL BE TYPE II ANODIZED PER MIL-STD-8825 AND COATED WITH HIGH PERFORMANCE POLYESTER.
D. SAFETY: ALL SYSTEM COMPONENTS SHALL BE UL LISTED FOR THE APPROPRIATE APPLICATION.

2.3 STRUCTURAL PARAMETERS
A. WIND LOADS: WIND LOADS SHALL BE BASED ON THE 2015 NATIONAL BUILDING CODE (NBC) OF CANADA AND A DESIGN WIND PRESSURE OF 0.80 KPA.
B. POLE STRUCTURAL DESIGN: THE STRESS ANALYSIS AND SAFETY FACTOR OF THE POLES SHALL CONFORM TO THE 2015 NATIONAL BUILDING CODE (NBC) OF CANADA.
C. FOUNDATION DESIGN: THE FOUNDATION DESIGN SHALL BE BASED ON SOILS THAT MEET OR EXCEED THOSE OF A CLASS 5 MATERIAL AS DEFINED BY THE 2015 NATIONAL BUILDING CODE (NBC) OF CANADA.
D. FOUNDATION DRAWINGS: PROJECT SPECIFIC FOUNDATION DRAWINGS STAMPED BY A REGISTERED ENGINEER IN THE PROVINCE WHERE THE PROJECT IS LOCATED ARE REQUIRED. THE FOUNDATION DRAWINGS MUST LIST THE MOMENT, SHEAR (HORIZONTAL) FORCE, AND AXIAL (VERTICAL) FORCE AT GROUND LEVEL FOR EACH POLE. THESE DRAWINGS MUST BE SUBMITTED AT TIME OF BID TO ALLOW FOR ACCURATE PRICING.

2.4 CONTROL SYSTEM
A. 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 CALL 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.
B. REMOTE MONITORING SYSTEM: SYSTEM SHALL MONITOR LIGHTING PERFORMANCE AND NOTIFY MANUFACTURER IF INDIVIDUAL LUMINAIRE OUTAGES ARE DETECTED SO THAT APPROPRIATE MAINTENANCE CAN BE SCHEDULED. THE CONTROLLER SHALL DETERMINE SWITCH POSITION (MANUAL OR AUTO) AND CONTACTOR STATUS (OPEN OR CLOSED).

C. 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 LAMP OUTAGES, CONTROL OPERATION AND SERVICE SCHEDULING INCLUDING RELAYING OPERATIONS COMPLETED AND SCHEDULED. MOBILE APPLICATION WILL BE PROVIDED SUITABLE FOR IOS, ANDROID AND BLACKBERRY DEVICES.
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. CURRENT LAMP HOURS: SHALL BE TRACKED SEPARATELY TO REFLECT THE AMOUNT OF HOURS ON THE CURRENT SET OF LAMPS BEING USED, SO RELAMPING CAN BE SCHEDULED ACCURATELY.
3. REPORT HOURS SAVED BY USING EARLY OFF AND PUSH BUTTONS BY USERS.

D. COMMUNICATION COSTS: MANUFACTURER SHALL INCLUDE COMMUNICATION COSTS FOR OPERATING THE CONTROLS AND MONITORING SYSTEM FOR A PERIOD OF 10 TO 15 YEARS.
2.5 APPROVED MANUFACTURERS
A. TIME POWERED ADJUSTMENT TECHNOLOGY - MUSCO'S GREEN GENERATION LIGHTING® SPORTS LIGHTING SYSTEM WITH A METAL HALIDE LIGHT SOURCE.
B. ALL LISTED MANUFACTURERS NOT PRE-APPROVED SHALL SUBMIT THE INFORMATION AT THE END OF THIS SECTION, AND AN ADDENDUM WILL BE ISSUED PRIOR TO BID. LISTING APPROVED LIGHTING MANUFACTURERS AND THE DESIGN METHOD TO BE USED.

C. DESIGN APPROVAL: THE OWNER / ENGINEER WILL REVIEW PRE-BID SUBMITTALS FROM ALL THE MANUFACTURERS TO ENSURE COMPLIANCE TO THE SPECIFICATION. IF THE DESIGN MEETS THE DESIGN REQUIREMENTS OF THE SPECIFICATIONS, AN ADDENDUM WILL BE ISSUED INDICATING APPROVAL FOR THE SPECIFIC DESIGN SUBMITTED.
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.

TABLE WITH 10 COLUMNS: CMT, CIRCUIT DESCRIPTION, TRIP, POLES, A, B, C, POLES, TRIP, CIRCUIT DESCRIPTION, CMT

TRANSFORMER 'TA'
FIELD LIGHTING POLE 'A1'
FIELD LIGHTING POLE 'A2'
FIELD LIGHTING POLE 'B1'
FIELD LIGHTING POLE 'B2'
FIELD LIGHTING POLE 'B3'
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FIELD LIGHTING POLE 'B59'
FIELD LIGHTING POLE 'B60'

TABLE WITH 3 COLUMNS: TOTAL PHASE LOADS, TOTAL LOAD, LIGHT LEVEL

OWNER
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-COMFORMANCE: IF, IN THE OPINION OF THE OWNER OR HIS APPOINTED REPRESENTATIVE, THE ACTUAL PERFORMANCE LEVELS INCLUDING FOOTCANDLES AND UNIFORMITY RATIOS ARE NOT IN CONFORMANCE WITH THE REQUIREMENTS OF THE PERFORMANCE SPECIFICATIONS AND SUBMITTED INFORMATION, THE MANUFACTURER SHALL BE REQUIRED TO MAKE ADJUSTMENTS TO MEET SPECIFICATIONS AND SATISFY OWNER.
10-YEAR WARRANTY
B. EACH MANUFACTURER SHALL SUPPLY A SIGNED WARRANTY COVERING THE ENTIRE SYSTEM FOR 10 YEARS OR FOR THE MAXIMUM HOURS OF COVERAGE BASED ON THE ESTIMATED ANNUAL USAGE, WHICHEVER OCCURS FIRST. WARRANTY SHALL GUARANTEE LIGHT LEVELS WILL NOT FALL BELOW TARGET MAINTAINED LEVELS. A -10% DESIGNATING ALLOWANCE WILL NOT BE ALLOWED. WARRANTY SHALL ALSO COVER LAMP REPLACEMENTS, SYSTEM ENERGY CONSUMPTION, MONITORING, MAINTENANCE AND CONTROL SERVICES. SPILL LIGHT CONTROL, AND STRUCTURAL INTEGRITY. MANUFACTURER SHALL MAINTAIN SPECIFICALLY FUNDED FINANCIAL RESERVES TO ASSURE FULFILLMENT OF THE WARRANTY FOR THE FULL TERM. WARRANTY MAY EXCLUDE FUSES, STORM DAMAGE, VANDALISM, ABUSE AND UNAUTHORIZED REPAIRS OR ALTERATIONS.
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D. MAINTENANCE: MANUFACTURER SHALL MONITOR THE PERFORMANCE OF THE LIGHTING SYSTEM, INCLUDING ON/OFF STATUS, HOURS OF USAGE AND LAMP OUTAGE FOR 10 YEARS FROM THE DATE OF EQUIPMENT SHIPMENT. INDIVIDUAL LAMP OUTAGES SHALL BE REPAIRED WHEN THE USAGE OF ANY FIELD IS MATERIALLY IMPACTED. OWNER AGREES TO CHECK FUSES IN THE EVENT OF A LUMINAIRE OUTAGE.

A. ELECTRIC POWER REQUIREMENTS FOR THE SPORTS LIGHTING EQUIPMENT:
1. ELECTRIC POWER: 800 VOLT, 3 PHASE.
2. MAXIMUM TOTAL VOLTAGE DROP: VOLTAGE DROP TO THE DISCONNECT SWITCH LOCATED ON THE POLES SHALL NOT EXCEED THREE (3) PERCENT OF THE RATED VOLTAGE.
B. ENERGY CONSUMPTION: THE AVERAGE KW CONSUMPTION FOR THE FIELD LIGHTING SYSTEM SHALL BE 88.82 KW. THE MAX KW CONSUMPTION FOR THE FIELD LIGHTING SYSTEM SHALL BE 74.8 KW.
C. REVISED ELECTRICAL DISTRIBUTION: MANUFACTURER SHALL PROVIDE, AT THEIR COST, REVISED ELECTRICAL DISTRIBUTION PLANS TO INCLUDE CHANGES TO SERVICE ENTRANCE, PANEL, AND WIRE SIZING IF USING LIGHTING METHOD 2.

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TABLE WITH 3 COLUMNS: TOTAL PHASE LOADS, TOTAL LOAD, LIGHT LEVEL

A. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER IF SOIL CONDITIONS EXIST OTHER THAN THOSE ON WHICH THE FOUNDATION DESIGN IS BASED, OR IF THE SOIL CANNOT BE REMEDIATELY EXCAVATED. CONTRACTOR MAY ISSUE A CHANGE ORDER REQUEST / ESTIMATE FOR THE OWNER'S APPROVAL / PAYMENT FOR ADDITIONAL CONSTRUCTION OF FOUNDATION. FOUNDATIONS SHALL BE ALLOWED TO CURE FOR A MINIMUM OF 28 DAYS BEFORE THE POLE STRESS IS APPLIED USING SHORTER CURE TIME APPROVED BY STRUCTURAL ENGINEER OF RECORD.
2. ADDITIONAL MATERIALS REQUIRED TO ACHIEVE ALTERNATE FOUNDATION:
3. EXCAVATION AND REMOVAL OF MATERIALS OTHER THAN NORMAL SOILS, SUCH AS ROCK, CALICHE, ETC.
3.2 DELIVERY TIMING
A. DELIVERY TIMING EQUIPMENT ON-SITE: THE EQUIPMENT MUST BE ON-SITE 4-6 WEEKS PRIOR TO SUBMITTAL OF APPROVED SUBMITTALS AND RECEIPT OF COMPLETE ORDER INFORMATION.
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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.
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