TOBIQUE FIRST NATION

TECHNICAL SPECIFICATIONS

BASEBALL FIELD LIGHTING SUPPLY -
KCIW KNICANEWEK SPORTS AND RECREATION PARK

TOBIQUE FIRST NATION, NB
Project no. EVOQ 9223-18-00
Project no. Roy Consultants 493-18-04

ISSUED FOR TENDER
2021-05-14

Part 1 GENERAL

1.1 DESCRIPTION OF SYSTEM

.1 Manufacturer to supply a new lighting system for the Baseball field at the new Sport and Recreation Park in Tobique. Price shall be presented into the following categories:

- .1 Supply of LED luminaires;
- .2 Supply of steel poles for luminaires;
- .3 Supply of precast concrete base;
- .4 Supply of control system and commissioning

.2 Attached electrical sketch SKE1 shows the proposed location for field lighting. Manufacturer to verify and recommend optimal pole placement for lighting.

.3 Manufacturer shall be responsible to run and provide simulation results of proposed lighting layout with the new luminaires. The manufacturer shall provide the lighting simulation file to the consultant for review. The manufacturer shall supply lighting equipment to meet or exceed the standards set forth in these specifications.

.4 Lighting system shall be entirely LED and as described in Part 2.

.5 Luminaires shall be mounted on supplied steel poles. The installation of the luminaires shall not be part of this tender. Installation will be done by others. However, the supplier shall provide support to installation contractor and perform the start-up, commissioning and training of the system.

.6 Pre-cast concrete base shall be designed to support the metal poles supporting the luminaires and shall account for the wind/snow factors.

.7 Lighting shall either come factory aimed or supplier shall aim luminaire on site during commissioning.

1.2 REFERENCES

.1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)

- .1 ANSI/IEEE C62.41, latest revision, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.

.2 ASTM International Inc.

- .1 ASTM F1137, latest revision, Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners.
- .2 ASTM A123/A123M, latest revision, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM A167, latest revision, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
- .4 ASTM A366/A366M, latest revision, Specification for Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.

.3 Illuminating Engineering Society of North America (IESNA)

.1 IES Lighting Handbook, Reference and Application.

.2 IES LM-79, latest revision, Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

.3 IES LM-80, latest revision, Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules

.4 IES TM-21, latest revision, Projecting Long Term Lumen Maintenance of LED Light Sources

.5 IESNA RP-6, latest revision, Recommended Practice for Sports and Recreational Area Lighting

.4 Canadian Standards Association (CSA International)

.5 ICES-005, latest revision, Radio Frequency Lighting Devices.

.6 Underwriters' Laboratories of Canada (ULC)

.1 UL 94, latest revision, Test for Flammability of Plastic Materials for Parts in Devices and Appliances.

.2 UL 508, latest revision, Industrial Control Equipment.

.3 UL 8750, latest revision, The Standard for Safety of Light Emitting Diode (LED) Equipment for use in Lighting Product.

.7 Design Lights Consortium (DLC).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit shop drawings and product data for each type of luminaires, for review by the owner and consultant. Shop drawings shall include but not limited to the following:

.1 Physical description of luminaire including dimensions, weight, finishes and all accessories applicable to the installation under this project.

.2 Description of the driver and associated surge suppression.

.3 Photometric data, certified by a qualified independent testing agency, in IESNA format, based on certified results of laboratory tests for the driver/LED array combination applicable to the installation under this project. (LM-79 test report)

.4 Energy efficiency data including wattage consumption per lumen package. (LM-79 report)

.5 LM-80 test report for the LED array applicable to the installation under this project.

.6 Description of lumen maintenance for the driver/LED array combination applicable to the installation under this project. (in accordance with TM-21.

.7 Wiring diagram of system.

.8 Concrete base and steel pole.

.9 Control system.

.10 Warranty information.

.2 Manufacturer’s Instructions: submit manufacturer’s written installation instructions and special handling criteria, installation sequence, wiring schematic and cleaning procedures.

.3 Submit lighting analysis results meeting requirements laid out by section 2.2. Lighting design shall include but not limited to:

.1 Outline of area being lighted, illuminance levels at grid spacing of not less than 9.14 x 9.14 meters at 1 meter from ground level.

.2 Mounting height, number of fixtures, aiming angles, as well as luminaire information including wattage, lumens and optics.

.3 Summary table showing horizontal Lux levels, the number and spacing of grid points, average, minimum and maximum illuminance levers in Lux, uniformity including maximum to minimum ratio, coefficient of variance, uniformity of gradient, number of luminaires, total system kilowatts and light loss factor used.

.4 Lighting level at the adjacent apartment building shall also be indicated.

.4 Provide a list of similar projects installed with LED sports lighting.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area;

.2 Replace defective or damaged materials with new.

.4 Packaging waste management: remove for reuse and return pallets, crates, padding and packaging materials.

.5 Divert unused materials from landfill to recycling facility.

1.5 QUALITY ASSURANCE

.1 Manufacturer's Warranty: submit manufacturer's standard warranty document.

.2 Provide maintenance materials as required and as recommended by manufacturer. Include the furnishing of two (2) additional luminaires as spares.

.3 Manufacturer’s warranty to include as a minimum the replacement of all failed components within an LED light fixture, including but not limited to LED arrays and LED drivers for a period of minimum five (5) years from the date of commissioning.

.4 Manufacturer must guarantee illumination levels shall not drop below desired target values in accordance to section for the full warranty period.

.5 The manufacturer’s warranty letter to be furnished by the Electrical Distribution Agency responsible for the lighting system for this project. The letter to include as a minimum the following:

.1 Contact information for the Electrical Distribution Agency

.2 The description of the warranty and the warranty period for the product(s)

.3 The effective date of the warranty

.4 A reference number for the particular project for ease of reference

Part 2 PRODUCTS

2.1 GENERAL

.1 All LED luminaires to be DLC Standard version 4.1 listed.

.2 All LED luminaires to conform to UL 8750.

.3 All LED luminaires to have published supporting LM-79 and LM-80 reports for the driver/LED array combination applicable to the installation under this project.

.4 All LED luminaires to have published reports confirming the maintenance of the rated lumen output to 70% at 50,000 hours or greater. Measurement of such must be in accordance with TM-21.

.5 Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested. Luminaires can be aimed on site during commissioning instead if preferred. The manufacturer shall submit a complete working system.

.6 Light fixture manufacturer with a minimum of 5 years of success manufacturing LED light fixtures for the Canadian market. The agency representing the manufacturer is an established company that has had and currently maintains a locally run and operated business in New Brunswick for at least five years. A listing of five (5) projects must be provided (if requested) where the manufacturer's similar products have been used in Canada, including location, contact person and telephone number.

.7 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 C62.41.2_2002.

.8 Manufacturer shall provide a bird repellant system at the top of the pole and luminaires.

.9 Manufacturer shall provide lightning grounding as follows:

.1 Integrated grounding via concrete encased electrode grounding system.

.2 If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, #6 AWG copper down conductors, and exothermic weld kits.

.10 Provide wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.

.11 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.

2.2 LED ARRAY

.1 LED array to be replaceable.

.2 Fixture voltage to be 347V, single phase or 600V three phase.

.3 LED color temperature to be minimum 5000K.

.4 CRI minimum 75.

.5 Lighting Simulations must demonstrate the following requirements:

.1 Infield – Horizontal (fc): 50 fc minimum average maintained.
.2 Outfield –Horizontal (fc): 30fc minimum average maintained.
.3 Infield Uniformity Ratio: 2:1 max.
.4 Outfield Uniformity Ratio: 2.5:1 max.
.5 Infield CV=0.17 or less
.6 Outfield CV=0.21 or less
.7 Appropriate light loss factors shall be applied and submitted for the basis of design.

.6 Design consideration:

.1 Lighting should minimize shadows and provide good modelling of the players.
.2 Proposed floodlight location should produce good visibility that also minimized glare for the players
.3 Avoid lighting interference (i.e., beams aimed in order from the nearest to the furthest target area will not cross each other.)
.4 Mounting height of the bottom row of luminaires for all poles is 21.3 meters.
.5 Playing field includes 4.6 meter foul zone strip on each side.
.6 Lighting should be designed to reduce lighting level to adjacent apartment building.

2.3 CONTROLS

.1 Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

.2 Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on auto selector switches shall be provided.

.3 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.

2.4 STRUCTURAL PARAMETERS

.1 Design: Structural materials methods, loads and design in conformance with the National Building Code of Canada (NBC) 2015, and the latest edition of all other applicable standards and codes. All work and installation shall also comply with applicable municipal and provincial regulations, in the absence of specific requirements in the above, work shall conform to sound building practice and quality workmanship. The structure is located in Tobique First Nation, New Brunswick.

.2 Steel Pole Structure: Provide drawings (including loads, reaction and design parameters) of the pole structure with the pole to base connection stamped and signed by a qualified professionals

engineer licensed in the province of New-Brunswick, Canada, and sent for approval to consultant. These drawings must be submitted at time of bid to allow for accurate pricing. All material exposed to weather conditions shall be hot dip galvanized as per ASTM A123 for a minimum zinc coating of 600 g/m². Pole to be round and must contain an accessible hand holes for wiring.

.3 Concrete Foundation Base: Provide drawings of the base (including loads, reaction and design parameters) stamped and signed by a qualified professionals engineer licensed in the province of New-Brunswick, Canada, and sent for approval to consultant. These drawings must be submitted at time of bid to allow for accurate pricing. The foundation design shall be based on soil parameters as outlined in the attached geotechnical report. It shall be protected from frost actions and surrounded by a firm compacted soil free of organic. The concrete shall have air-entrained and have a minimum compressive design strength at 28 days of 30 MPa (refer to CSA standards for other requirements). A precast concrete base is allowed. Base shall have wire way with wire access hole below grade. It must contain integrated grounding electrode (other means of grounding may be provided, but must be approved by consultant).

Part 3 EXECUTION

3.1 INSTALLATION

.1 Not included in this contract.

.2 Provide installation support to the contractor installing the product.

.3 Provide start-up, commissioning and training activities.

3.2 FIELD QUALITY CONTROL

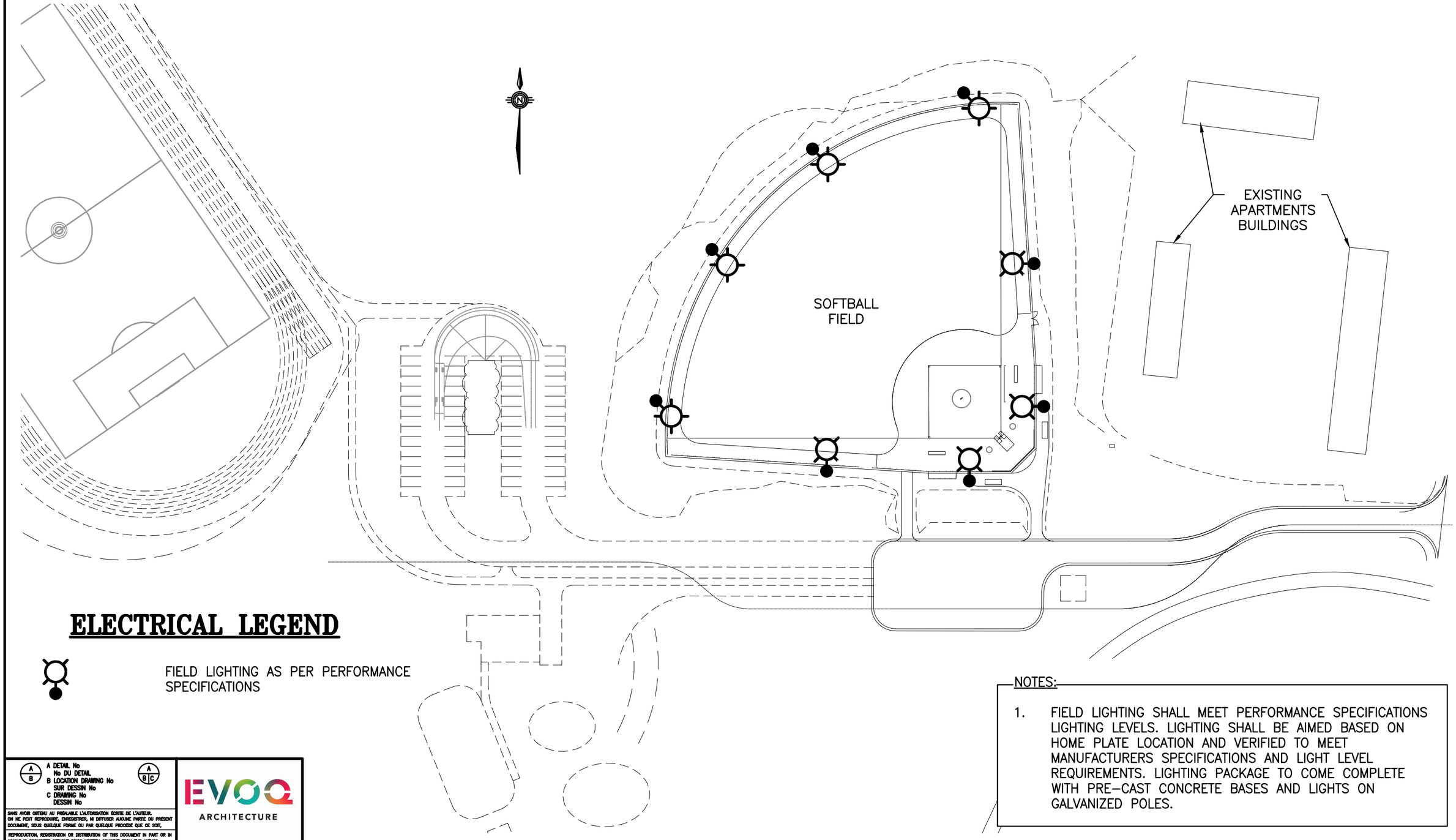
.1 Perform commissioning of the lighting system once system is installed;

.2 Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period.

.3 The manufacturer shall be responsible for an additional inspection one year from the date of commissioning of the lighting system and will utilize its own light meter in the presence of the owner.

.4 The manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities.

END OF SECTION



ELECTRICAL LEGEND

FIELD LIGHTING AS PER PERFORMANCE SPECIFICATIONS

NOTES:

1. FIELD LIGHTING SHALL MEET PERFORMANCE SPECIFICATIONS LIGHTING LEVELS. LIGHTING SHALL BE AIMED BASED ON HOME PLATE LOCATION AND VERIFIED TO MEET MANUFACTURERS SPECIFICATIONS AND LIGHT LEVEL REQUIREMENTS. LIGHTING PACKAGE TO COME COMPLETE WITH PRE-CAST CONCRETE BASES AND LIGHTS ON GALVANIZED POLES.

A DETAIL No / No DU DETAIL
B LOCATION DRAWING No / SUR DESSIN No
C DRAWING No / DESSIN No

EVOQ ARCHITECTURE

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-ELECTRICAL-
PROPOSED LOCATION OF BASEBALL LUMINAIRE

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