



**REQUEST FOR PROPOSAL FOR OF THE DESIGN BUILD UPGRADE OF THE
MAST LIGHTING AT LARRY GOMES STADIUM
(RFP ID # 020-PROJ- 050- 052024)**

SECTION 3 EMPLOYER’S REQUIREMENTS

3.1 OVERVIEW

The Sports Company of Trinidad and Tobago (SPORTT) is in the process of upgrading the Larry Gomes Stadium – mast lighting and flood lights on the building infrastructure for athletic track to meet or exceed international standards. SPORTT is seeking to engage a suitably qualified Contractor to carry out the required upgrade works as specified.

The existing high mast lighting system in conjunction with the building infrastructure lighting for the athletic track close to the canopy will be upgraded to more energy efficient LED fixtures.

The upgraded lighting system will serve primarily **the match field and the athletic track**, and will provide the following:

- a. Multiple illuminance levels for different sporting activities to meet FIFA Level B standard and World Athletics standard, with a minimum of 1500 lux on the playing field and 500 lux on the track.
- b. Allow for Remote Access Control by fixed arrangements of programmable dimmable system.
- c. The lighting system shall be energy efficient and cost effective to operate.
- d. Guaranteed light levels, meeting environmental and safety requirements as detailed in this document.

The areas to be illuminated are:

- a. The match field, approximately 68m x 105m. *See LGS Site Plan Drawing (Attachment B)*. Adjustment may be required if the dimensions vary. The FIFA Lighting Standard B applies from the *FIFA Lighting Guide (Attachment C)*.
- b. The match field is surrounded by an eight (8) lane athletic track and pavilion (seating) that the contractor shall be aware of in their design of the luminaire lighting. The lighting level required shall be ≥ 500 lux as per the World Athletics/IAAF Standard for International Competition.



Consideration was given to the lighting levels required for “Main Cameras at Major Events” as per the *Chartered Institution of Building Services Engineers (CIBSE) LG4 Sports Lighting Addendum (Attachment D)*.

3.2 EMPLOYER-SUPPLIED INFORMATION

Electrical Consultants were engaged to prepare the technical requirements of this RFP as well as to perform IR (Insulation Resistance) integrity testing of the electricity supply to each of the masts from the main electrical panel and main circuit breaker in the control room. The supply to each mast was tested and found to be in good working order. The cable to the Canopy Flood Lights with their isolator will have to be replaced. The cable should be placed in cable trays.

Tenderers will make any corrections identified as required in the Employer’s Requirements herein, the Scope of Works and provide a design using their suggested brand(s) of lighting fixtures to achieve the minimum of 1500 lux on the playing field and 500 lux on the track.

The following technical information is included to assist Tenderers with their Tender preparation:

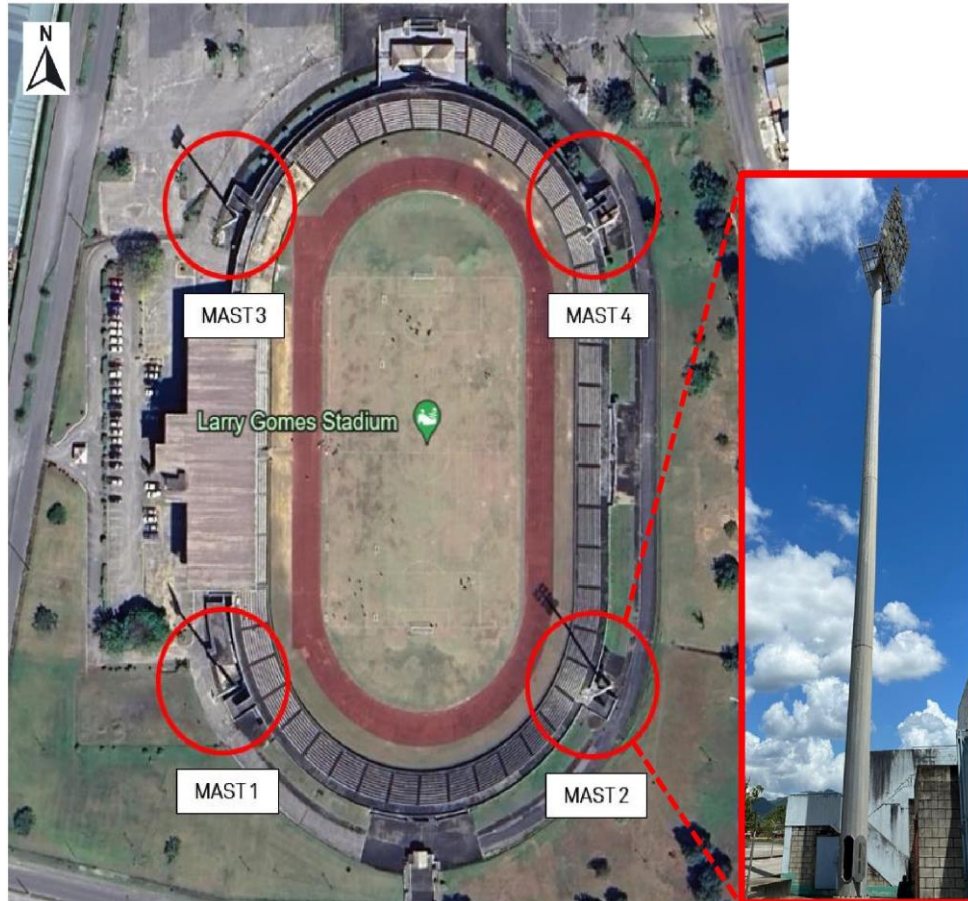
- a. Employer’s Requirements and briefing (Scope of Work and Specifications)
- b. Main Summary & Schedule of Prices **(Attachment A)*
- c. System Architecture Electrical Schematics* *(Attachment E)* – to be used as a guide by the contractor in their mast lighting upgrade design and construction of the upgraded electrical network and operation of the required Mast Lighting system.
- d. LGS Site Plan Drawing * *(Attachment B)* of the existing electrical layout, with controls and control equipment for facilitating the upgrading of the electrical system design.

***These documents are enclosed in the Attachments.**

Tenderers are directed to take their own measurements to ascertain the accuracy or thoroughness of the technical input information furnished by the Employer or his agents. No claims attributable to errors or deficiencies in Employer-supplied information shall be entertained. Tenderers shall be solely liable for all aspects of their designs.



The Design-Build Contractor shall be responsible for verifying and interpreting data made available by the Employer.



3.3 EXISTING SYSTEM

The existing supply to the masts consists of **480 VAC 3-phase** circuit from Service Distribution panel to Control equipment cabinet power circuit breaker and then 277 VAC phase to neutral distributed to the electrical components in the enclosure as is required for each mast location in the lighting zone. There are existing flood lights affixed to the beam under the canopy (of the Main Pavilion) to supplement the lighting of the athletic track, it consists of **four (4)** - 220 volts single-phase flood lights interconnected from a single pole switch inside the control room.

a. Lighting Operation West

There are two (2) masts (north-west and south-west) named Mast West with existing floodlights a total of one hundred and thirty-two (132) 2000 Watts metal halide, and twelve (12) 500 Watts High-Pressure Sodium fixtures, a total of 144 lighting fixtures. Each Mast has seventy-two (72) lighting fixtures. This information shall only be used as a guideline to assist



in the construction work for the lighting upgrade of the Mast West. *See LGS Site Plan Drawing (Attachment B).*

b. Lighting Operation East

There are two (2) masts (north-east, and south-east) named Mast East with existing floodlights a total of eighty-four (84) 2000 Watts metal halide, and twelve (12) 500 Watts High-Pressure Sodium fixtures a total of 96 lighting fixtures. Each Mast has forty-eight (48) lighting fixtures. This information shall only be used as a guideline to assist in the construction work for the lighting upgrade of the west mast. *See LGS Site Plan Drawing (Attachment B)*

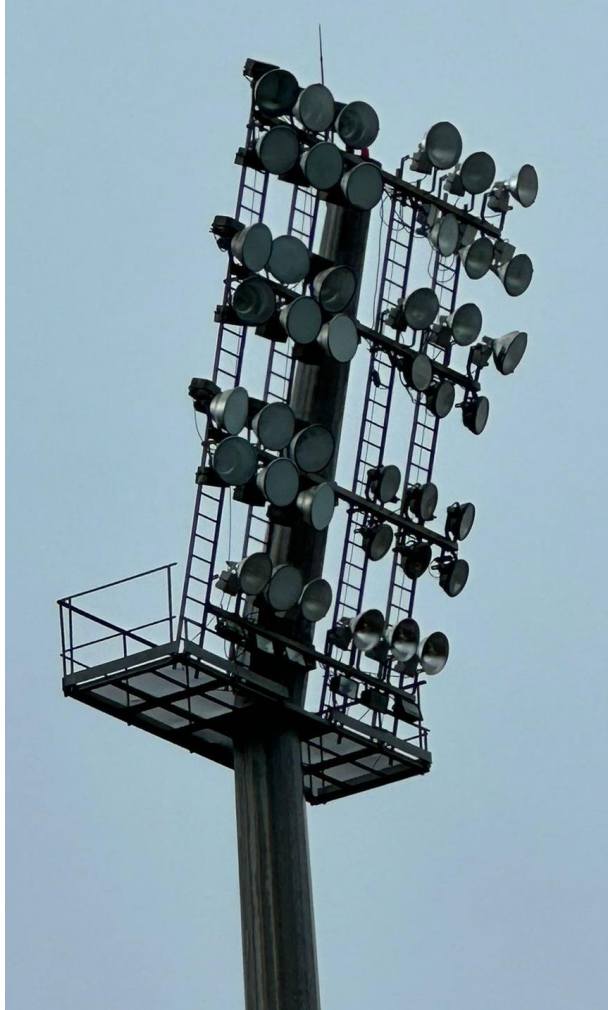
c. Lighting of Track below the Canopy

There are four (4) existing 220 Volts single phase flood lights electrically interconnected and installed on the cross-member beam that focussed on the track below the canopy to avoid the shadow casted by the canopy. The flood lights are controlled by one (1) single pole single throw switch inside the control room on the third floor of the building.

d. The Cradle

The lighting fixtures at the top of the lighting mast structure are secured to 4"x4" Rectangular Hollow Steel Sections (RHS, Schedule 40, Heavy Galvanized Steel), which are cantilevered off the main lighting mast structure. There is also a service platform at the top of the lighting mast support structure (just below the lighting fixtures) with external service/access ladders. This lighting assembly is illustrated in the photos below. Any additional cross members to be added to the existing frame can be attached by drilling to the frame and using like material. Screws used must be "Heavy Galvanized Steel Bolts sealed with Silicone". Using a member size of 1/8" thickness, a 4"X4" RHS with an 8 ft cantilever, a conservative load of 200 lb/ft can be applied to the cross member, which is below the actual capacity of the member.

Structural Engineering Assessments were performed on the four masts, confirming that the masts were fit for use. Dimensions will be provided subsequently.



3.4 UPGRADED SYSTEM

The upgraded system shall consist of LED High Mast Lighting and LED lights for the track under the Canopy. The lighting under the canopy is to offset the shadow on the athletic track caused by the canopy when illuminated from the west masts. The lighting is to meet the lux requirements outlined in the FIFA and World Athletics standards stipulated in this RFQ, together with remote access and dimming capability.

a. Lighting Operation West

- i. The upgrade to new LED fixtures with dimmer modes capability will be set up as follows per mast (West).



- ii. The operation of the Dimmer Control shall determine the sequence of luminaire lighting and the illuminance. The number of LED lights, wattages and their arrangement on the Mast West shall be in accordance to meet or exceed the lighting requirement stipulated in this document, and dimmer mode up to competition level \geq 1500 lux or better to attain the minimum of 1500 lux on the playing field and \geq 500 lux on the track.

b. Lighting Operation East

- i. The upgrade to new LED fixtures switching with dimmer modes will be set up as follows per mast (East).
- ii. Control of the dimmer and switching modes shall determine the sequence of luminaire lighting and the illuminance. The number of LED lights, wattages and their arrangement on the Mast East shall be in accordance to meet or exceed the lighting requirement stipulated in this document, and dimmer mode up to HDTV level \geq 1500 lux or better to attain the minimum of 500 lux on the track.

c. Lighting of Track below the Canopy

- i. The upgrade to new LED fixtures switching with dimmer modes will be set up as follows for the lights focussing on the tracks below the canopy to obtain a lux \geq 500lux.
- ii. The operation of the Dimmer Control shall determine the sequence of luminaire lighting and the illuminance. The number of LED lights, wattages, and their arrangement on the beam underneath the canopy shall be in accordance to meet or exceed the lighting requirement stipulated in this document for the World Athletic (WA) standard up to competition level \geq 500 lux on the track.

3.5 SCOPE OF WORK

The contractor shall supply, deliver, install, and commission the LED High Mast Lighting and LED lights for the track under the Canopy, Electrical Structure and Equipment in accordance with the Employer's Requirements, Scope of Works, Architecture and Drawings & Specifications contained herein and as indicated on accompanying documents. These works shall include, but shall not be limited to the following:

- a. The electrical contractor shall design, supply and install the infrastructure (inclusive of Control Panel, Luminaires, Drivers, Dimmer switches and accessories and Dimmer circuits, Remote Access Controls (RAC), telecommunication network and Control Monitor panel and inclusive of auxiliary transformers, lightning arrestors with digital protection capability, aviation lights, Conduits, Risers, Pull Boxes, Trunking, Raceways, low voltage Din rail, circuit breakers, contactors, terminal blocks, bash board and accessories) for the upgraded systems inclusive of:



- i. Control power cabling associated with the new LED lighting network and control system.
 - ii. Lighting — internal and external within the masts and at the camera location above the control room
- b. Cordoning off construction areas around the masts using caution tape to ensure the safety of all users of the facility, employees, and security, inclusive of installing visible safety signage.
- c. Provision of site accommodation/storage and portable toilet(s) based on the number of workers on-site. Electrical and Water services will be provided by SPORTT. However, the contractor will have to make the necessary interconnection with the supervision of SPORTT's personnel.
- d. Claim for Traffic Management for Crane and Long Boom Manlift (that can reach the height of the top of the masts cradles) to the project site location, used for dismantling and take-down of the top of the four (4) masts cradles and existing fixtures.
- e. The removal of:
 - i. The existing high mast lighting controls and accessories from the base of the tower, including all the ballasts, interconnection, and fittings with backboard and debris.
 - ii. The existing track Flood lights on the centre crossbeam under the canopy and its electrical accessories inclusive of circuit breaker and single pole single throw switch.
- f. The removal of all the existing high mast lighting fixtures and lighting fixtures brackets and cradle all to be dismantled on the ground. All modification, assembling and interconnection of LEDs inclusive of maintenance work to make good the system shall be done on the ground.**
- g. Compile all refuse and salvage equipment to be disposed to a suitable site location appointed by SPORTT.
- h. Supply and installation of new LED lighting control systems, assembly of LED light fixtures, make initial adjustment accordingly on the ground. Make all apertures good on masts cradle, brackets and on cross-member beam to prevent any form of corrosion. To be inspected and approved by client.
- i. Supply and Installation of Transient Voltage Surge Suppressor (TVSS) to protect the equipment for each mast and track lights under the canopy and all auxiliary equipment,



277 VAC power circuit breakers in each control equipment, control equipment panel with contactors, control breakers, fuses, contactors, din rails, terminal bars, equipment backboard, driver units with housing among other accessories to make the upgraded system operates in accordance with the stipulated performance of the Employer's Requirements, the Scope of Works and BOQ. **All components stated here to be assembled on the ground for the four (4) masts for safety and to an extent security purposes.**

- j. Supply and installation of new low voltage multi-core copper strand wire XLPE insulator cable from the lighting contactor panels to the weatherproof junction box/s (depending on the box size to outfit all terminals for the components wiring).
- k. Traffic management of crane to site to provide removing and lifting of the cradle with accessories to the top of the four (4) masts is to be coordinated with SPORTT's personnel. Connection of the new LED lighting fixtures and brackets to the cradle and complete assemble should be outfitted on to the four (4) masts at ground level. The low voltage multi-core copper wire XLPE cable should be connected to the terminals inside the weatherproof junction boxes at this time.
- l. The electrical contractor shall supply any sub-circuit wiring including conduits, trunking, raceways, cable trays, conductors, outlets, switches, isolators, and accessories associated with the new installation.
- m. The contractor is to make good any penetrations made in mast structure and in areas where penetrations need to be made larger than 6" square, the contractor must first provide a methodology for the provision and make good of the penetration for the approval of the client's representative. Areas made right must be of the same quality as the surrounding component, that is, aluminium coated and protected from corrosion.
- n. Minor assembly works, adjustment and testing of the luminaires for the masts in addition to installation of the aviation lights and lightning detection unit shall be done utilizing the manlift and crane.
- o. The Contractor shall provide their man-lift, crane, and scaffolding (if required) with their approved fitness and legally approved-to-work tested certification for the project, as well as any protection of the existing seating below or SPORTT property. They are to ensure that the area around the work zone is correctly cordoned off. The man-lift platforms are to be fitted with toe boards and handrails to protect workers beneath and within the platform respectively. At no times are workers to be below the platform when the man-lift and crane are in operation.
- p. The Contractor must note that the height of the mast they will be working on is forty-seven (47) meters from the ground and the cradle on top of the mast is approximately three (3)



meters in height. Therefore, they must take all the necessary precautionary measures to prevent any accident as they will be working at heights and in confined space. Note that workers shall be removed from site for not conforming accordingly until proper protective and safety measure are being practice and put in place.

- q. Proper termination of all weather-exposed electrical connections with safety-sealed connectors or approved equal material must be used inclusive of properly sealing off and treatment of all weather-exposed junction boxes, electrical fittings and accessories etc.
- r. All weather-exposed metal conduits shall be corrosion resistant, or corrosion protected, including but not limited to brackets, mounting bolts & nuts, cable-trays, glands, and other mounting accessories.
- s. Miscellaneous items to be catered for shall include Cable Trays, Supports, Fittings, System Design, As-Built Drawings, Grounding, Testing of the works for compatibility to be approved by SPORTT's personnel, Inspection. The testing of Ground Resistance, and a Thermographic Scan of the installation after completion, Commissioning, Inspection Fees, if applicable.
- t. Ensure that all systems associated with the lighting infrastructure are adequately earthed.
- u. The electrical contractors shall also cater for all testing inclusive of material strength, malleability and infrastructure but not limited to, grounding and infrared testing of the final installation.

The contractor is to consider the above listing when preparing their pricing and is **to submit a detailed method statement, risk matrix and risk assessment** for the project to enable SPORTT to ascertain item cost.

The contractor must note that the works to be carried out in some instances will be at the height of approximately fifty (50) meters from ground level. It is the responsibility of the contractor to ensure **ALL** health, safety, and environmental policies are enforced during the execution of the project.

The Facility will not be closed during the execution of the works. The Contractor will therefore be required to coordinate/schedule with SPORTT's Representative the movement of the crane and any other large equipment to and from and within the site, laydown locations and durations to ensure minimal disruption of daily/planned activities.

Please be reminded: Contractors must submit a methodology for the execution of the works. The method statement must clearly state the safety aspects and must include a risk assessment, risk matrix, and mitigation strategies.



3.6 CONTRACTOR SUBMITTALS

Contractors will provide:

- a. A list of all Resources to be Used on-site, their designation, and rates (*Appendix IX*).
- b. A listing of all Tools and Equipment inclusive of manlift, crane and haulage equipment to be on site working, period of work, indicating rates and whether owned or rented (*Appendix X*)
- c. A listing of Materials to accomplish the work. (*Appendix XI*)
- d. Contractors shall provide a draft of the construction design demonstrating compliance with their proposed illuminance lux levels, vertical and horizontal one to each side line over ninety-six (96) light levels points of the given field and lux levels on the track utilizing (5 m x 5 m) grid spacing.
- e. CAD Shop Drawings of the LED lighting fixtures and brackets, with product brochures, technical literature details for associated controls, remote control and equipment including the transient voltage surge suppressor (TVSS).
- f. A signed Statement of Compliance - *Appendix VII*, shall be submitted by the electrical contractor indicating that he is compliant/non-compliant with all items in the specification. If this is not received, then it will be assumed that the contractor is compliant with all things in the specification as detailed and asked to provide these items at no additional cost to the client.

3.7 SPECIFICATIONS

In general, the quality of all tasks to be performed must be consistent with best practice in the relevant sector for all work outlined in the attached Bill of Quantities, complimented with the specifications stipulated in the Employer's Requirements and Scope of Works. The Contractor should specify his standard (to be determined of relevance by SPORTT's personnel) and quality criteria in any area not addressed by SPORTT in its documents.

The installation shall be done according to the applicable local and international codes and standards to meet FIFA requirements for **Class B level and IAAF/WA requirements**. The Electrical Contractor shall be responsible for obtaining all the electrical inspection certificates for the installation where necessary.

All components of the proposed solution shall be UL-compliant, meet IP and temperature requirement, environmentally friendly and shall consider the corrosive nature of the environment and proximity of the installation to the ocean. The replacement of the high mast



lighting inclusive of those for the tracks on the I- beam underneath the canopy system electrical infrastructure material and installation should adhere to the following:

- a) OSHA - Occupational Safety and Health Administration
- b) NEC - National Electrical Code
- c) TTBS 171 Part 1- Low Voltage Standard
- d) NFPA — National Fire Protection Code
- e) NFPA 780 – Installation of Lightning Protection Systems

3.8 OUTCOME AND PERFORMANCE STANDARDS

- 3.8.1 A lighting system that adequately provides lighting levels up to at least 1500 lux for the match field and 500 lux on the athletic track.
- 3.8.2 Delivered and installed products shall comply with the description and quality specified by SPORTT's Employer's Requirements herein.
- 3.8.3 Periodic (at least fortnightly), the successful contractor shall submit a written notification of the status of the project inclusive of any hindrance encountered.
- 3.8.4 Contractor will respond to queries by SPORTT within 24 hours maximum.
- 3.8.5 Communication is expected immediately with an update of problems encountered by the successful Contractor in meeting the targets set out in this document and thus affecting the delivery schedule.
- 3.8.6 On-time system inclusive of material and equipment procurement and delivery within the agreed cost/budget and schedule.
- 3.8.7 The Contractor shall be held responsible for all changes necessary for compliance in achieving the specified light levels and uniformities.
- 3.8.8 Contractor shall be held responsible for any damage caused to the work area inclusive of the field, pavilion and athletics track during the execution of the project and is responsible for repair work.

3.9 DELIVERABLES

- 3.9.1 The successful Contractor shall supply, deliver, install, and commission all items or products as agreed to and in the time as stated in this document.



- 3.9.2 The Contractor shall present a certificate (if necessary, depending on the type of work being done) from the Electrical Inspectorate as evidence that the system has met their approval and compliance.
- 3.9.3 The Contractor's scope shall include the submission of a "Preventative Maintenance Procedure with schedule" (as-prescribed by the manufacturers) for the LED lighting system supplied with a list of appropriate spares and source of supply for these.
- 3.9.4 The Contractor upon completion shall hand-over to the client's representative two (2) sets of the equipment specification sheets and manuals for the equipment installed and "As-built" drawings of the upgraded system (2 hardcopy, 1 soft) **within 20 days**.
- 3.9.3 Prototype test certification for the equipment showing all standards and optional accessories to be supplied.
- 3.9.4 The testing of Ground Resistance, and a Thermographic Scan of the installation after completion.
- 3.9.5 Proper circuit protection and identifying labels and signs in each mast and on I beam lighting for the track under the canopy.
- 3.9.6 Transfer of knowledge and training to the assigned SPORTT's personnel in the operations of the upgraded system.

3.10 PROJECT DURATION

The total project duration shall not be more than **120 Calendar Days** inclusive of procurement of material from the date of the contract execution (that is, signing of the contract).

3.11 DELIVERY TIMING

Procurement and delivery of material and equipment from external source must be on site within **eight (8) weeks** from receipt of approved submittals.

The contractor should be doing the preliminary works during procurement and delivery time such as, safety and protection, interconnection of utilities, setting up of office and storing area, placing of plant and equipment, dismantling of lightings and associated equipment, cleaning and make good the approved items to be reused, testing and maintenance work.

Installation works and commissioning timing should be within **eight (8) weeks** after the receiving of the material from external source.



3.12 CONTINGENCY PLAN

The contractor/vender should include a contingency plan in their proposal.

3.13 ELECTRICAL CHARACTERISTICS - MAIN DISTRIBUTION AND SUBCIRCUIT I-BEAM LIGHTING UNDERNEATH THE CANOPY FOR THE TRACK

The system supply voltage of the mast light towers, from the distribution panel in the Main Electrical room is 480/277 VAC 3-phase. The power is transmitted to each Mast via a 120mm² x 4-cores XLPE SWA cable. The four (4) Main circuit breakers for the supply voltage to the masts rated at 250 Amps each.

The system supply voltage for the Track lights under the canopy should be within 220 to 277 Volts single phase. The electrical installation should meet the NEC and Local Electrical Code requirements.

Sub-Circuit Wiring

The contractor shall be responsible for the supply and installation of any subcircuit wiring associated with the new LED lighting system. The works shall include all conduits, trunking, raceways, cable trays, outlets, switches, surge suppressors, drivers, contactors, circuit breakers, all accessories, and conductors commencing from the distribution panel. Also, the scope of work shall also include the wiring to the lighting fixtures and any outlets at the top of the mast, such as junction box/s with terminal connectors, lightning arrestors with grounding cable and aviation lights.

Any wiring other than that of armoured cables must be installed in conduits, raceways and or trunking all placed inside the masts. It shall include all the high mast lighting control system wires.

Raceways & Supports

The Contractors shall cater for all Cable Trays, Trunking, Raceways, Harness and Supports in their quotations that are necessary for the proper installation of all cables, conductors, equipment and light fixtures.

Conductors

The conductors to serve the lighting, and all control systems shall be of the stranded copper, XLPE insulated, and 600 Volts rated and current capacity compatible with the load being fed and



associated circuit breaker. Further information is as provided under Electrical Characteristics subheadings for materials.

Labelling of Conductors

All high current cables, except sub-circuit wiring enclosed in trunking or conduits, shall be affixed with labels at each end through non-releasable plastic straps unless otherwise stated. Tags shall contain the following information:

- a. Cable size & Number of conductors
- b. The origin of the cable, (The panel where the cable is being fed from)
- c. The destination of the cable, (The panel which the cable is feeding)

Low Voltage Power Cable

The contractor shall utilize XLPE insulated multi-cored copper conductors for feeds to all connections between the lighting contactor panel and the junction boxes at the top of the mast. Flexible rubber sheath cable shall be used from the junction box to the luminaires to avoid any break in the cable from rotation, adjustment, and crystalizing from Infra-Red Radiation. The cable size and other characteristics shall be as indicated in the BOQ.

3.14 EARTHING & LIGHTNING SYSTEM

The integrity of the existing ground system for each mast to be verified for good working condition and the necessary remedial action taken based on the outcome for conformity to NFPA 780 and NEC article 250. Each mast should consist of a dynamic atmosphere (dynasphere) or equivalent digitally receptive lightning air terminal. Each mast should be used as the grounding conduction element for earthing purposes. The resistance reading for the grounding system shall be 5 ohms or less. Grounding resistance greater than 5 ohms will imply that special grounding measures must be implemented to achieve the required reading.

The contractor shall ensure that the earthing leads are firmly bonded to the grounding system copper electrode and masts with earthing bars, cleat, etc. Also, the contractor shall ensure that the lightning system network is incorporated with a lightning event counter interconnected inside the base of each mast.



3.15 COMMISSIONING & CERTIFICATION

Upon completion, the Contractor shall be responsible for the testing, commissioning, and certification of the new LED lighting system in the presence of SPORTT's Representatives. The Contractor shall present a certificate (if necessary, depending on the type of work being done) from the Electrical Inspectorate as evidence of the system has met the approval. The Contractor's costing shall include for the certification and priced separately for construction account purposes. The Contractor shall carry out all works according to the National Electrical Code of Practice [NEC] and any other special code and standard requirements.

3.16 MAINTENANCE PROCEDURE

The contractor's quotation shall NOT include the cost for the maintenance of the system during the Defects Liability Period of twelve (12) months. It is the responsibility of the contractor to note that the Defects Liability Period commences after successful commissioning of the system, that is, at the time of Issue of the Hand-Over Certificate. The contractor however shall state in writing the breakdown of the cost to maintain the system during the stipulated warranty period. Note that it is a requirement by the contractor during the defects liability period to address any defects.

3.17 DEFECTS LIABILITY PERIOD

The Defects Liability Period is twelve (12) calendar months from the date of receipt of the Hand-Over Certificate and this is based on the contractor's obligation for the completion of Outstanding Works and Remedying Defects.

The Contractor shall state the cost for a thirty-six (36) month maintenance period after the Defects Liability Period. It shall consist of workmanship and the replacement of items or equipment under the manufacturer's warranty. *This cost must be provided separately.*

3.18 WARRANTY & GUARANTEE

The Contractor's Warranty applies to the overall system and installation and begins when the equipment is installed and commissioned. The Contractor shall cater for a warranty period of five (5) years from receiving and installation of the material on site, that is, the signed warranties and guarantees stated by the supplier for the LED lighting system, controllers and accessories used in the project. The successful Contractor shall forward to the client's representative all equipment warranties and guarantees no later than fifteen (15) days after the issuance of the hand over certificate.

The Supplier's or Manufacturer's warranty for the luminaires is 10 years.



3.19 EQUIPMENT DELIVERY, INSTALLATION & VALIDITY PERIODS

The Contractor must indicate the validity period of his proposal from the time of the tender closing date. The Contractor's proposal must show the delivery time of any equipment and material that he will supply for this project from the date of order (for material out of Trinidad and Tobago) and must include the installation duration of the total system assuming no delays. He shall also indicate any probable problem/s that could delay the installation. The Contractor should be aware that the best compliant contractor tender is of utmost importance.

3.20 TENDERERS

Contractors shall use the Employer's Requirements, SOW, the attached Schedule of Prices and Main Summary Sheets inclusive of their design as a guide for the submission of their tenders. It is the responsibility of the Contractor to review all and ensure the correctness of all quantities. The Contractor shall provide project management services for correctness of services and product and should be on site for all testing purposes.

3.21 SAFETY PROCEDURES & MEASURES

Contractors must note that they will be working at the height of approximately 50 metres above ground level. The Contractors must cater for any costs associated with the adherence to and implementation of **ALL** necessary safety procedures during the removal of the existing system, the installation, and commissioning of the new LED lighting system. The Contractor must submit their safety procedures before any recommendation for award is made.

3.22 TESTING

The Contractors are required to include in their proposal for the following tests to be carried out. The price to conduct the test shall fall under the works to be provided by the Contractor (Contractor's obligation) for the system as per the Employer's Requirements, Scope of Works and Schedule of Prices.

- a. A thermographic infrared scan of all the terminations to be made during the installation of the new LED lighting system. Note that no digital infrared thermometer is allowed for the scans. The results shall be presented in an understandable format and must include a digital picture alongside the thermal image of the items that are scanned, and inclusive of electrical parameters relevant for interpretation. The infrared scan must be performed with the system fully loaded. The infrared scan must be carried out not later than one (1) week after commission.



- b. Testing of the lightning protection and grounding system as installed. This test should include glaring effect from the four (4) sides of the perimeter border.
- c. The contractor shall in addition to the above be responsible for the inspection, testing and certification of the complete installation. The approved certification shall be submitted to the client's representative not later than two (2) weeks after completion.
- d. Testing of the Switching Mode Dimmable system in accordance with SPORTT's requirement.
- e. Testing of the Remote Access System (RAC) and network and the mobile application for mobile access.

All tests must be supervised/witnessed by the client's representative(s) and vendor (manufacturer) representative.

3.23 CONTRACTOR'S MODE OF OPERATION

The successful contractor shall be prepared to work along with any other sub-contractors nominated or stakeholders of the facility to meet the project timeline and goals. It may mean night-time or weekend work, and this shall be catered for in the tender price and the rates shall be in accordance with the information provided in contractor's proposal, see *Appendix IX - Resources, Appendix X - Tools and Equipment to be used on site and Appendix XI - List of Materials* to be procured for the project installation works.

3.24 DESIGN PARAMETERS

The Contractor shall, in his design, consider all parameters as specified in the Technical Specifications, FIFA Lighting Guide (Appendix XI), Lighting Guide for Television (Appendix XII) and System Architecture (Appendix XIII) and all other requirement as stated in this section of the RFP (Section 3 – Employer's Requirements).

3.25 OPERATIONS, MAINTENANCE AND SERVICE LIFE

- Operating Components: Remaining operable for 5 years under normal exposure conditions for the project site.
- The planned service life of all mechanical, electrical and electronic equipment shall be 15 years. The planned service life shall take into account the maintenance requirements of the relevant materials and equipment.



3.26 AS-BUILT DRAWINGS

Contractor to Supply a full and complete set of "As-Built" Drawings

- a. Contractor shall provide to the Engineer on completion of the Works a full set of the Contract and/or Working Drawings together with any other relevant details and information fully marked up, revised, and updated to indicate the final construction and form of the whole of the Works as completed.
- b. During the construction of the Works, one set of the working drawings shall be kept in a 'record set' by the Contractor on the site marked up to show, as they occur; any variations in the Works, location of services uncovered, obstructions, etc. This set of marked-up 'record' drawings shall be made available for inspection by the Engineer whenever required and ultimately used as the basis for a final set of "As-built" drawings.
- c. The "As-built" set of drawings shall be completed and delivered to the Engineer as soon as possible after the completion of the Works. The Taking Over Certificate shall not be issued by the Engineer until the "As-built" drawings are received and reviewed. The Contractor shall provide the drawings in AutoCAD latest version format on duplicate CD's (compact discs) plus one set of non-fade hard copy prints of each "As-built" drawing. The Contractor shall also provide a readable photocopy of the site 'record set'.
- d. Any failure of the Contractor to submit the "As-built" set of drawings within sixty days of the completion of the works will entitle the Employer to have such drawings prepared by others at the Contractor's expense.

3.27 CONTRACTORS CONSIDERATIONS

- a. The Employer makes note that currently, the Larry Gomes Stadium is currently being occupied by employees of SPORTT as well as contractors for janitorial and security services. However, the areas to be upgraded will be handed over to the Design-Build Contractor.
- b. Submission of all handover documents to include maintenance manuals, warranties, and guarantees, records of finishes utilized inclusive of suppliers and contact information.
- c. The Design-Build Contractor should ensure that all fixtures, fittings, and equipment are supported locally for ease of replacement and repairs.
- d. Any statutory approvals to be submitted to the Employer.
- e. The Employers Requirements are to be read in conjunction with the schedule of prices and relevant appendices.



3.28 SAFETY REQUIREMENTS

Safety Officer

The Contractor shall ensure that all safety measures are observed during the implementation and execution stages of the entire project. The contractor should ensure that his resources always include qualified and experienced Safety Officer(s) and skilled workers inclusive of a supervisor while the work is being carried out on site.

Details of Equipment, Labour, Staff, and Materials

The Contractor shall submit a monthly report to the SPORTT Project Manager/Engineer (within five working days of the first day of each following month) listing all plant, equipment, labour, and other personnel on-site, both his own and that of any sub-contractors broken down separately for each day of the preceding month.

Advance Notification of all Operations

In addition to these general obligations under the Contract, full and complete notice shall be given by the Contractor of all operations to be carried out on the site. Such notice shall be provided in sufficient time for the Engineer to make all necessary arrangements for inspection and checking.

Health, Safety, and Environment

The Design-Build Contractor shall submit for the approval of SPORTT a detailed HSE Plan that will comply with the Trinidad & Tobago OSH Act 2004. The Design-Build contractor shall, in a timely manner, revise and resubmit the program incorporating all comments received from SPORTT.

The Design-Build Contractor shall provide experienced health and safety officers for the whole duration of the work.

The HSE plan is required before any works can commence on the sites.

Project Specific Certification

The Contractor's personnel working on this project must have *relevant certification* in Confined Space Access and Working at Heights. Equipment such as harnesses and lift equipment must be certified/approved for use. All Operators of lift equipment must be trained and certified. All will be required to attend SPORTT's HSE Orientation before work can commence.



3.29 REPORT SUBMISSION

Progress reports will be as required in *Section 7.0 Particular Conditions of Contract Sub-Clause 4.21*.

A final Electrical Design Report - Inclusive of the methodology, guidelines, and technical specifications employed in the execution of the Designs, Codes, Standards, and Regulations.

3.30 QUALITY ASSURANCE

As required under Clause 4.9 of the Conditions of Contract, the Contractor shall operate his own Quality Assurance system in accordance with the ISO 9001:2008 or equivalent acceptable system to The Employer.

The Contractor shall control quality-related activities for key processes to ensure output meets the specified requirements. The submission of any item at any stage to the Engineer shall not form part of the direct quality control process and shall not relieve the Contractor of his responsibility for meeting the specified requirements. Such submissions shall be regarded as part of the commitment and responsibility of the Contractor to interface with the Engineer to ensure confidence in the output and work.

The Contractor shall prepare a Quality Plan before carrying out any construction, inspection, and testing of items. This Quality Plan shall be submitted to the Employer within 2 weeks of the issue of the order to commence the Works.

The Contractor shall prepare a schedule of sections of the plan and in general separate sections shall be provided for each item or element of the work. In the context of this clause construction shall be taken to include design, manufacture, and fabrication.

The Contractor's Quality Plan shall:

- list the stages in execution, identifying the processes and all planned inspections and tests to be performed by the Contractor or his sub-contractors to demonstrate the compliance of items with the Specification.
- define work instructions, inspections and test procedures to be used (control documents).
- identify records to be generated at each stage of the construction (verification documents);
- Identify or refer to documents that specify acceptance criteria.
- Identify or refer to documents that specify the instruments used for inspections and tests.



The Contractor should note that the Engineer will choose which items of the work he wishes to inspect and that he will not necessarily inspect all items of work.

3.31 PRELIMINARIES

Description

Preliminaries are all indirect works associated with and considered necessary for the overall execution of the project. These works shall consist of the following:

a) Identification of Employees

The Design-Build Contractor shall be responsible for furnishing to each employee and requiring each employee engaged on the work to display, identification as approved and directed by the Project Manager.

b) Sanitation

The Design-Build Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Project Manager.

c) Safety Signs

The requirements for safety, or other warning signs, their content, and location shall be as provided in the Health & Safety Plan. The signs shall be erected within 5 working days after receipt of the notice to proceed. Upon completion of the project, the signs shall be removed from the site.

d) Security & Storage

The Design-Build Contractor shall be responsible for securing and storing his own equipment and materials as well as securing the temporary site accommodation.

e) Cleaning

The Design-Build Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud that is tracked onto paved or surfaced roadways shall be cleaned away daily or as directed by the Project Manager. Materials resulting from demolition activities shall be appropriately stored before offsite disposal within the area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

f) Electrical Power & Potable Water Electrical power and potable water are available on site. The Design-Build Contractor shall determine existing points of supply and make



provisions for temporary distribution as required, maintain and remove upon completion of the Works.

g) Bonds

Allow for furnishing a Performance Bond in the sum of ten (10) percent of the tender figure for the due performance of this contract and pay all financing charges in connection therewith. The Employer shall make available an advance payment as stated in the Appendix to Tender. Allow for furnishing an advance payment bond and pay all financing charges in connection therewith.

h) Insurances

The Design-Build Contractor shall jointly indemnify and protect SPORTT from any obligations arising from any event in relation to:

- Insurance against injury to Damage to third Parties (persons and property)
- Insurance for the Design-Build Contractor's Personnel (National Insurance Scheme & Workmen's Compensation)
- Insurance for the Works and the Design-Build Contractor's Equipment

Accordingly, allow for all costs, expenses and provide satisfactory documentary evidence in connection with same.

i) Site Administration

Provide competent supervisory and administrative staff for the duration of the Works.

j) Site Preparation Works

Make allowances for the Employer's staff to utilize safely the areas that won't be worked on by the Design-Build Contractor.

k) Site Office & Staff Welfare - Contractor's Site Accommodation

The Contractor should provide his own Site Office (inclusive of furniture) and Equipment Laydown Area. SPORTT will make available a meeting room to conduct Site Meetings with the Contractor. The Team Changing Rooms and washrooms will be designated for use by the Contractor to use for workers' welfare. Sufficient health and safety equipment and drinking water shall be provided to accommodate Contractor's on-site staff.

If still required the Contractor may provide temporary structures, sheds etc. as deemed necessary and remove on completion of the Works.



The Contractor shall provide all janitorial services to the assigned washroom facility within the Employer's facility along with all necessary janitorial consumables.

The Contractor to ensure no health and safety violation and to maintain the health standard set by the Employer. The Contractor to allow the Employer to conduct routine inspection of same.

The Contractor to conduct an assessment to the said facilities prior to the handing over of the washroom facility to the Contractor to which the Contractor shall be responsible for all necessary repairs and remedy at his own cost all defect/deterioration to the said facilities during the course of the project duration and complete these repair works prior to the issuing of the Taking Over Certificate.

3.32 TECHNICAL SPECIFICATIONS:

The technical specification below shall form part of the overall specifications, and the works shall be adhered to accordingly.

A. AREAS REQUIRING ILLUMINATION - MATCH FIELD & ATHLETIC TRACK

The FIFA Lighting Guide (lighting Standard B) *Appendix XI* applies to the illumination of the match field:



1.7. FIFA lighting standard B	
Ev 0° (vertical illuminance on 0° reference plane)	Minimum > 650 lux Average > 1,000 lux
Uniformity U1v-0°	> 0.40
Uniformity U2v-0°	> 0.50
Ev 90° (vertical illuminance on 90° reference plane)	Minimum > 650 lux Average > 1,000 lux
Uniformity U1v-90°	> 0.40
Uniformity U2v-90°	> 0.50
Ev 180° (vertical illuminance on 180° reference plane)	Minimum > 650 lux Average > 1,000 lux
Uniformity U1v-180°	> 0.40
Uniformity U2v-180°	> 0.50
Ev 270° (vertical illuminance on 270° reference plane)	Minimum > 650 lux Average > 1,000 lux
Uniformity U1v-270°	> 0.40
Uniformity U2v-270°	> 0.50
Eh (horizontal illuminance)	Minimum > 1,200 lux Average > 2,000 lux
Uniformity U1h	> 0.50
Uniformity U2h	> 0.70
Match continuity mode (MCM)	Eh ave > 1000 lux within 3 minutes Eh ave > 2000 lux within 15 minutes
Flicker factor (FF)	average < 12% maximum < 15%
Minimum adjacent uniformity ratio (MAUR)	> 0.60 ≤ 30 failures
Colour temperature (Tc)	5,000-6,200K
Colour rendering (Ra)	≥ 80Ra
Glare rating (RG)	< 50
Maintenance factor (MF)	0.90 for LED 0.80 for HID

The football field is surrounded by an eight (8) lanes athletic track and pavilion (seating) that the contractor shall be aware in their design of the luminaire lighting design.

The **illuminance required for athletics** for televised and non-televised activities is presented in the table below.

Activity Level	Horizontal Illuminance Eh avg. (lux)*	Uniformity		Colour Properties of Lamps	
		U1 Emin/Emax	U2 Emin/Eave,	Colour Temp.	Colour Rendering



				Tk (K)	Ra
Recreational and Training	75	0.3	0.5**	>2000	>20
Club Competition	200	0.4	0.6	>4000	>/=65
National and Int'l. Competition	500	0.5	0.7	>4000	>/=80

Illuminance values are minimum maintained average values; initial values are 1.25 times higher.

** When only the track is to be used and the in-field lights are switched off, U2 should be >= 0.25.

Glare Rating (GR)	</=50
Uniformity Gradient (UG) per 5 metre (Only for National and International Competitions)	</=20%

Refer to **E-W Elevation Drawing of Main Pavilion** and **N-S Elevation Drawing of Main Pavilion**
(Attachment F and Attachment G)

B. SYSTEM MODE OF OPERATION

Pitch Illuminance Switch Mode

The pitch illuminance shall be determined through the Pitch Illuminance Switch Mode (PISM) being programmed with various modes setting catering for different events, namely, Competition at a minimum of 1500 lux, HDTV at a minimum of 1200 lux, TV at a minimum illuminance level of 900 lux and Training >/= 500 lux.

Dimmer Unit System

The Dimmer Unit system shall be installed within the Operator Control Monitor panel with all the necessary control and communication facility. The Dimmer system should be Multi-Watt, Nonpolar and programmed to have Remote Access Control capability for the control of the luminaires on each mast and for the system to operate remotely. The dimming control system must be programmed to operate the upgraded lighting system at multiple energy and illuminance based on the activity.

The dimming control incorporated with RAC set up shall be mounted within the SPORTT's Control Operating Room of the stadium. The dimming control shall be outfitted with override system control function to allow authorized SPORTT Company personnel to override normal dimming control schedule.



The dimmer unit mode of operation should be programmed for different illuminance levels for the type of activities and also for energy savings. The illuminance levels and activities (as stipulated in the document) catered for will be as follows:

Competition – min of 1500 lux

HDTV – min of 1200 lux

TV – min of 900 lux

Training – 500 lux

The dimming operating system should be programmed to operate at 25%, 75% and 100% capacity based on the energy savings requirement.

Dimmable function and remote access

Provision of three (3) core cables for the circuit wiring of high/medium/low switches within the operator control panel with remote access control feature. The maximum distance for the running and interconnection of the 2.5 sq. mm XLPE cable should be approximately 800 m.

Provision of control voltage supply 120/240 Vac or as is required based on contractor's design for each mast lighting control circuits.

Control and Monitoring cabinet complete with four (4) independent controllable dimming illuminance levels.

Dimming Control via primary electrical feeds to each mast/via wireless feeds, whichever the contractor utilize in his design.

Driver Requirement

The Driver unit should be designed with dimming features and have the following electrical characteristics as set out below.

The Driver unit should be placed in the driver cabinets with accessories in the base of the masts for easy access and suitability of maintenance. To ensure best operation and reliability the light engine of the luminaire must be thermally isolated from the driver component/unit if placed on top of the mast.

Driver Unit Electrical Characteristics

The inrush current rating should be < 40 Amps at a duration of 250 microsecond,
best used HID/D-curve 15 Amps circuit breaker



Ambient Temperature < 50 degrees centigrade

IP rating IP66

Efficiency >95% and comprising of dimming mode operation.

Flicker < 3%

Total Harmonic Distortion (THD) < 20%

Maximum operating current per luminaire <= 6 amps @ 277 VAC, 60 Hz and

Energy consumption range 25% to 100%.

Environmental Light Control

Proposition shall include the following:

All luminaires shall incorporate spill light and glare control characteristics and shields for all areas of concern and for adjacent properties. Measurements for these levels should be taken at areas of concern in accordance to Lighting Ordinance taken locally and internationally.

Environmental Glare impact scans readings from the field edge of the map of the surrounding area must be submitted for assessment. Similarly, the Spill Scan reading showing horizontal and vertical measurements taken at intervals along the boundary/perimeter line at warm up time >1 hour all in accordance with the IESNA LM-5-04 standard.

C. MATERIAL SPECIFICATIONS:

Transient Voltage Surge Suppressor (TVSS)

This section describes the materials and installation requirements for transient voltage surge suppressors for the protection of all the Masts AC electrical circuits. These are to be installed in line with the voltage in the low voltage panels in the base of each mast via new circuit breakers.

The following standards shall be used for the selection of a TVSS.

- a) ANSI/IEEE : C62.41, C62.45 & C62.48
- b) National Electric Code: 285
- c) The TVSS shall be listed by UL1449 Second Edition and UL 1283.

The TVSS must be marked with a short circuit current rating equal to or higher than available fault currents at the point of installation. This is 2002 NEC, Article 285.6, and such specification and requirement is to be adhered by the contractor.



The TVSS shall provide surge current diversion paths for all modes of protection; L-N, L-G, N-G in WYE systems the preferred interconnection, for ease of reference and manufacturers availability of the unit.

Each mode including N-G shall be fused with a UL Recognized 200kA/C surge rated fuse and incorporate a thermal cut-out device. The thermal cut-outs are for the protection against sustained overvoltage.

The TVSS must meet the minimum requirement or exceed the following criteria based upon exposure level:

The minimum surge current capability (single pulse rated) per phase shall be: -

- a) Branch Panel boards 70 – 100 kA
- b) UL 1449 Listed and Recognized Component Suppression Voltage Ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G	MCOV	Max Continuous Sinusoidal RMS Over Voltage L-N
220Y/127	330V	330V	330V	150V	
480Y/277	700V	700V	700V	320V	

The TVSS shall have a minimum EMI/RFI filtering of -50dB at 100kHz.

The TVSS shall monitor all modes: L-N, L-G and N-G.

The TVSS shall have a five-year warranty.

The TVSS shall be provided with individual suppression modules per phase for ease of maintenance.

The TVSS must be provided with an audible alarm. The alarm shall activate upon a fault condition. An alert in-line on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided.

The TVSS shall be provided with a surge event counter.

The TVSS shall be provided with an integrated disconnect switch/3-Pole breaker connecting the suppressor.





Electrical Installation of the TVSS:

The TVSS must be installed on the load side of the circuit disconnection device. The TVSS to be used in the system with the stipulated functions above shall be procured installed in accordance with the manufacturer's installation procedures and instructions.

Cable

All conductors must be stranded copper. All sub-feeder cables installed between the contactor panel and the LED fixtures shall be XLPE. insulated copper conductors rated 600/1000 Volts. Wiring shall be sized to ensure that a maximum of 2% voltage drop from the panels to the fixtures under full load conditions is obtained. Unless otherwise Specified branch wiring shall be identified by the colour of the insulation: -

	Old Colour Code	New Colour Code
Phase 1:	Red	Brown
Phase 2:	Yellow	Black
Phase 3:	Blue	Blue
Neutral:	Black	Grey
Earth:	Green	Green or yellow with green stripe

The preference by which the Contractor should abide is the application of the new colour code. With regards to motor wiring, where one colour conductors are used for all the phases, wire markers/numbers are to be installed at both ends of all runs to identify each conductor or phase wires to a motor. This recommendation of marking the ends of all runs depends on if the Luminaire Drivers are equipped and interconnected for remote control alignment adjustment.

Minimum Guideline specification for LED fixtures

The following table below contains the minimum LED fixture specifications. Tenderers shall adhere to these minimum guide specifications or if tender can provide a different combination of luminaires to meet or exceed the performance requirement for the upgraded lighting system. Failure to do so however will result in your tender not being accepted.

Below is the minimum guideline for the luminaires to be installed in the construction of the lighting system. Note that for reduction in construction time for the project:



All components can be designed and manufactured as a system, aligned, wired and tested. This will also be including cross-arms, wire harnesses, drivers, enclosures, etc. However, the proposal will be reviewed and approved by SPORTT for conformity.

All wiring shall be enclosed within the cradles/cross-arms, masts, and electrical components enclosures.

The harness must be complete with an abrasion protection sleeve, strain relief and preferably identifiable plug-in connections for ease of identification and installation.

Thermal Conductivity (Heat Transfer Rate)	>6000 W/mK
Supply Voltage	Multi-Volt 90 – 305 VAC Single phase
Fixture Housing	Heavy gauge die-cast aluminium with cooling fins/vent
Fixture Power	As desired to give desired illuminance
Surge (Common/Differential Mode)	6KV
Power Factor	>0.95
Photometrics (Beam Angle)	15 Degrees
Correlated Colour Temperature (CCT)	5,700K
Colour Rendering Index (CRI)	>70
IP Rating	IP 65/66
LED Luminous Efficiency	140 - 160 lm/W
Light Distribution	Asymmetrical/Rectangular
Working Temperature	<50 Degrees Centigrade
Fixture Life Span	>80,000 Hours
Glare	The glare must be very low (based on beam angle)
Dimming	Nonpolar
Mounting Bracket	Adjustable in horizontal and vertical plane (1" in 5 degrees increment)
Projection Distance	>250 Meters



Fixture Certification

Note that if the contractor chooses to use different types of LED based on their design, the performance of upgraded system must meet or exceed the stipulated system requirement.

The LED lighting fixtures must be certified by more than one of the following bodies: Underwriters Laboratories (UL), Design Lights Consortium (DLC), Electrical Testing Labs, and Conformité Européenne (CE)

Lighting Control Equipment Panel

Each light Mast shall consist of one lighting control equipment panel in its base with all the necessary control components to achieve control of the lighting system as indicated in this document.

Note that the new setup in the base of the masts shall include the manual on/off auto selector switches, Surge Protection unit, Electronic Drivers, Circuit Isolation component, Dimmer control Circuit devices, Controls circuits for System Override Switch to reinstate full match lighting conditions in the stadium, and new sets of wiring, among other accessories.

Contractors must note that the size for each lighting control panel is 60 inches in height by 30 inches in width by 10 inches in depth (H60" x W30" x D10"). The new system must be sized consistent with the space constraint and shall be dust and weatherproof-free, safe proof by the installation of cycle handle power supply breaker and shall incorporate lockable features to ensure no unauthorised entry. The cabinet must be painted in grey and shall be Aluminium powder coated. Note that based on the system operation, the panel might not hold all the components to be installed for ease of maintenance and operation suitability. In this case, a backboard/bashboard shall be installed in the Masts for the excess components, such as, driver unit cabinets, TVSS, etc.

Operator Monitor Control Panel

As stipulated, this control panel with complemented accessories shall be mounted inside the operator control room of the stadium. Voltage rating should be between 120 to 277 VAC, whichever is more convenient and practical to interconnect from the distribution section of the control equipment panel. The cabinet should conform to NEMA 4, IP 66. The Design-Build Contractor should provide proper circuit protection for the system in accordance with NEC, use 3- wire circuit installation for the stipulated system and wire sizing for a maximum distance of 750 metres. The equipment should be provided with proper grounding bar. Note that the system shall be protected by a current rated value disconnect switch or circuit breaker in the control equipment panel. The minimum circuit breaker interrupt rating must be greater than the short circuit current rating of 70 kA. and support lighting voltage up to 480 VAC.



The unit shall be complemented with instant on/off/auto luminaires dimming control keyed activated switches/manual override normal dimming schedule. Feature shall include wireless control (via phone/smartphone) application and monitoring system pre-set activity appropriate to the schedule levels utilizing high/medium/low-auto multi-watt switches, digital cellular antenna among other programmable operation, outfitted with maintenance detected capabilities and technology for future expansion.

Remote Access (lighting) Control (RAC) system to allow SPORTT's authoritative personnel to schedule on/off system operation via phone and a two-way TCP/IP communication link.

Communication interface with the luminaire drivers in the masts enclosure by means of digital powerline carrier communication and wireless communication medium.

Aviation Lighting Detector

The existing aviation light detector on top of each mast is to be tested to confirm compliance with the regulated aeronautical standard for single structures of certain heights above ground elevation. Failure of the complete unit shall be replaced accordingly with an aviation lighting system with solar powered built-in capability with reflector or equivalent specification and operation capacity.

Down Conductor Earthing Cable Specification Table.

Conductor Characteristics	Desired Values
Characteristic Impedance	< 12 ohms
Inductance	37 nH/m
Capacitance	0.75 nF/m
Cross-Sectional Area of Conductor	50 -70 mm ²
D.C. Resistance	0.5 mΩ/m
Impulse Resistance	6 mΩ/m
Withstand Voltage	250 KV
Weight	1.2 kg/m
Conductor Diameter	35 mm



Based however on lightning properties, it is recommended to do the construction works for the project without the lightning down conductor from the top of the masts system. The conductive property of the masts is best suited for this process.

Note on the Lightning Grounding System:

The lightning grounding system must have a low impedance to disperse the energy of any lightning strike. Because the lightning discharge consists of high-frequency components, the frequency-dependent electrical parameters of the grounding system are of great concern. Thus, the grounding impedance and resistance MUST be low (5 ohms or less).

On a note, the grounding network for each mast must consist of at least three (3) 8ft copper earth rods (depending on soil condition if the soil ground properties resistivity standard is high) placed at strategic points around each mast. If this method doesn't work, then the contractor shall have to use other means of earthing method to alleviate the issue. The ground conductor must be cad-welded and/or firmly bonded to the system.

3.34.1 PRICE PROPOSAL

The Contract Price shall be the lump sum Accepted Contract Amount and be subject to adjustments in accordance with the Contract. Any quantities which may be set out in a Schedule are estimated quantities and are not to be taken as the actual and correct quantities of the Works which the Contractor is required to execute. Any quantities or price data which may be set out in a Schedule shall be used for the purposes stated in the Schedule and may be inapplicable for other purposes. The Contractor shall prepare and submit a Price Proposal for carrying out and completing all works described in the "Schedule of Prices". At the Site visit(s), the Contractor shall satisfy himself as to the general, local and site conditions that may affect cost, progress, performance, execution of the Works.

3.34.2 MILESTONE SCHEDULE OF PAYMENTS

The Contractor shall prepare and submit a Milestone Schedule of Payments, which shall equate to his Price Proposal. This shall then form the Accepted Contract Amount.

3.34.3 METHOD STATEMENT

The Contractor shall set out details of the Methodology or Method Statement for the Works to demonstrate how it shall meet the Employer's Requirements. At a minimum, the Method Statement shall include the following:



- a) Details of the arrangements and methods which the Contractor proposes to adopt for the design and construction of the Works, in sufficient detail to demonstrate their adequacy to achieve the requirements of the Contract including completion within the Time for Completion stated in the Appendix to Tender. Outline of the arrangements which the Contractor proposes to adopt to manage coordination of Site access and movement within the site;
- b) Outline of the arrangements which the Contractor proposes to adopt to ensure compliance with the Employer's Requirements;
- c) Outline of the arrangements which the Contractor proposes for testing and snagging prior to completion and upon handover; and
- d) Outline of arrangements for handover, including completion of as-built drawings, warranties, preparation of operation and maintenance manuals, and handing over document.

3.34.4 QUALITY MANAGEMENT PLAN

The Contractor shall prepare and submit a **QA/QC Plan** which describes the processes of Quality Planning, Quality Assurance and Quality Control as these relate to this specific project. The Contractor shall describe the activities/practices to monitor both the processes and products to determine if the project is meeting the quality standards and identifying ways to mitigate risk or eliminate causes of unsatisfactory results. Quality control shall be performed throughout the duration of the project. The QA/QC Plan shall also detail the various tests/inspections to be carried out as per the requirements in **3.2 General Design Guidelines** and **3.3 Description of the Works**.

The Employer has the right to review inspection and test data and to perform quality inspections and audits of the Contractor's activities.

3.34.5 PROGRAMME

The Contractor shall prepare and submit a detailed Programme for the construction of the Works to be undertaken, including estimated start and finish dates for individual components and identification of major milestones and critical path. The proposed Programme shall be developed according to the Employer's Requirements and shall address the following:

1. Details of the proposed schedule for design of the Works, including the Contractor's Design Quality checks, certification and submission of design documents, review of the design by the Engineer;
2. Details of *hold points* for testing and test on completion;



3. Details of the proposed timeline for submission of As Built Drawings, Test results/reports, Equipment Drawings, Equipment information manuals, Warranties and guarantees for Equipment, Testing and Commissioning reports and Operation and Maintenance Manuals, User Training.
4. Details of the proposed timeline for the testing, commissioning, snagging, handing over of the completed Works, and Statutory approvals or certificates (if it applies).
5. Lead times required for ordering of materials.

The Employer's current software in use is Microsoft Project 2013. The software shall be compatible provided in an electronic file version of the Project Schedule that can be loaded or imported by the Employer using the Employer's scheduling software with no modifications, preparation, or adjustment.

The Contractor shall be responsible for updating scheduling software to maintain compatibility with current the Employer - supported scheduling software.

3.34.6 HEALTH AND SAFETY

The Contractor shall provide for complying with all health, safety, and welfare regulations, appertaining to all persons employed on the Site including those employed by Sub-Contractors, Statutory Undertakers, and visitors to the Site.

The Contractor shall provide Personal Protective Equipment ("PPE") for operatives, staff, representatives, and visitors to Site. The Contractor shall provide the documents below to show that it has in place sufficient safety policy documents and safety awareness to be able to perform their responsibilities in a safe and workmanlike manner.

The Contractor shall be required to carry out the Works in accordance with the **site-specific Health and Safety Plan** to be developed by it **following Contract award**. The Health and Safety Plan shall be submitted to the Employer for review and comments. Review and comments by the Employer shall not be construed to imply approval of any particular method or sequence for addressing health and safety concerns, or to relieve the Contractor from the responsibility for adequately protecting the health and safety of all workers involved in the Project, as well as members of the public affected by the Project.

The Contractor shall comply with all regulations and standards outlined in the Occupational Health and Safety Act 2004. The Contractor must ensure that the Health and Safety Plan is followed by all workers at all times.

The Health and Safety Plan shall contain a list of the detailed safety procedures to be followed. Safety procedures shall be prepared separately for individual activities and included in appendices to the Health and Safety Plan.



The Contractor's Health and Safety Plan shall provide for the following:

- i. Planning, management, and design to avoid hazards,
- ii. Subcontractor safety management,
- iii. Detection of potential hazards,
- iv. Timely correction of hazards,
- v. Provision of Product Specification Sheets and Material Safety Data Sheet for all chemicals to be used,
- vi. Emergency response procedures for the project,
- vii. Dedicated safety staff,
- viii. Documentation on how medical emergencies would be managed,
- ix. Accident reporting and investigation policy and procedures,
- x. Liaison with the Employer's monitoring staff,
- xi. Site safety orientation, training, and safety meetings, including a plan for indicating attendance at safety orientation (attendance to SPORTT's HSE & S Orientation is mandatory),
- xii. Substance abuse policy,
- xiii. Safe system of work procedures for the project.

In the event that the Contractor's employees or its Subcontractors fail to conform to the provisions of the Health and Safety Plan, the Contractor shall take appropriate disciplinary measures. Such measures shall include suspension, removal of offending employees from the Project Site, and dismissal. A copy of the current version of the Health and Safety Plan shall be kept on Site at each work location while work is being performed, and an appropriate notice shall be posted at each work location. The Health and Safety Manager shall implement, maintain, and monitor compliance with the Health and Safety Plan and all safety procedures.

3.34.7 SUBMITTALS

The following submittals to be delivered to the Employer shall include the following:

A. After signing of the Contract:

- i. Performance Security/Surety Bond duly stamped by the Board of Inland Revenue;
- ii. Advance Payment Guarantee (where required);
- iii. Insurances;



- iv. Programme;
- v. Method Statement;
- vi. Health and Safety Plan; and
- vii. QA/QC Plan

B. During the Contract execution:

- i. Design Development: 50% of Final Engineering designs and drawings;
- ii. Construction Documents: 85% of Final Engineering designs, For Construction Drawings, details and schedules;
- iii. As-built Drawings: 100% Completion of “As-built” Drawings and hand-over documents;
- iv. Design Reports;
- v. Progress Reports;
- vi. Updated Programme;
- vii. Updated Quality Management Plan;
- viii. Design Quality Records;
- ix. Provisional Operation & Maintenance Manual;
- x. Independent Design Checks (assessment and analytical); and
- xi. Contractor’s Inspection and Test Forms.

3.34.8 TESTING

Testing shall be carried out in accordance with the tests/inspections as described in the QA/QC Plan and the Contractor’s Technical Specification (Materials and Workmanship).

The Contractor shall always ensure that materials and equipment are examined and tested for compliance with the technical specification and quality control is then performed at the recommended frequency.

Materials shall be tested for compliance with stipulated specifications both at source and upon delivery to Site.

The Contractor shall prepare and submit a description of all the relevant tests and time periods for the testing of Materials and Works.



All materials used or approved material

supplied shall be accompanied by valid and certificates, tests and inspection reports. The minimum extent of examination and testing to be carried out and the acceptance levels/codes shall be specified by suppliers in the purchase order and/or subcontract documents.

An inspection schedule/plan shall be developed by the Contractor for procured equipment and materials. The Contractor's Construction Inspectors and Construction Supervisors shall carry out inspection surveillance activities. These include, but may not be limited to, witnessing tests; verifying documentation; and inspections/examinations. From these activities, reports shall be developed recording progress, findings, non-conformance, and resolutions.

Subcontractors shall be required to assign qualified/experienced inspection personnel to carry out all required examinations and tests in accordance with an agreed quality plan (inspection and test plan). These activities shall be carried out in accordance with the agreed procedures and guides and result in the appropriate reports. The Contractor's Construction Inspector and Construction Supervisor shall monitor the quality control activities of the subcontractor and carry out his own examination of material, equipment and documentation to the necessary degree to determine the state of acceptance. The Contractor shall ensure that the Employer and/or inspection authorities are given sufficient notice to witness the final inspection and tests, if required (e.g. Pressure testing of water lines, testing of Plumbing Fixtures, and Electrical Fixtures).

3.34.9 CONTRACTORS CONSIDERATIONS

- i. The Contractor will be required to protect the existing athletic track surfaces using rubber mattings, and must refrain from driving vehicles over 3-ton from driving onto the track or field. Only light trucks and mini-excavators with turf tyres will be allowed to traverse onto the field.
- ii. Submission of all handover documents to include operating manuals, maintenance manuals, warranties, and guarantees, inclusive of suppliers of spares and contact information.
- iii. The Contractor shall ensure that all fixtures, fittings, and equipment are supported locally for ease of replacement and repairs.
- iv. Provision of training to the Employer's Representatives in the operation of the system.
- v. The Employers Requirements are to be read in conjunction with the schedule of prices and relevant appendices.
- vi. Contractor's Accommodation

The Contractor shall provide temporary structures, sheds etc. as deemed necessary and remove on completion of the Works. Suitable space (minimum 20'x 20') shall be provided for Contractor's general workers' welfare. Sufficient health and safety equipment and drinking water shall be provided to accommodate on-site staff.



vii. Safety Signs

The requirements for safety, or other warning signs, their content, and location shall be as provided in the Health & Safety Plan. The signs shall be erected within 5 working days after receipt of the notice to proceed. Upon completion of the project, the signs shall be removed from the site.

viii. Security & Storage

The Contractors shall be responsible for securing and storing his own equipment and materials as well as securing the temporary site accommodation.

ix. Cleaning

The existing debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud that is tracked onto paved or surfaced roadways shall be cleaned away daily or as directed by the Engineer. Materials resulting from demolition activities shall be appropriately stored before offsite disposal within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

x. Electrical Power & Potable Water

Electrical power and potable water are available on site. The Contractor shall determine existing points of supply and make provisions for temporary distribution as required, maintain and remove upon completion of the Works.



EVALUATION CRITERIA

2.10.10 The criteria, requirements and scoring for the evaluation of submissions shall be as follows:

	EVALUATION/QUALIFICATION CRITERIA	REQUIREMENTS	MAX SCORE	MIN SCORE
Qualification 1	Eligibility of Contractor	Submission of all documentation required by this RFP, inter alia: <ol style="list-style-type: none"> a. Certificate of Incorporation, b. Valid VAT Certificate & Compliance Certificate, c. NIB Certificate & Compliance Certificate d. BIR Certificate & Compliance Certificate, e. Recent Annual Return f. Original Tender Security Bond g. OPR Registration Number and Lines of Business h. Declaration and Commitment Form 	Yes/No	
Qualification 2	Historical Contract Non - Performance Pending Litigation Judgements Against	Separate Statements provided on: <ol style="list-style-type: none"> 1. No History of Non-performing contracts 2. Pending Litigation 3. Past judgements within the last five (5) years. 	Yes/No	
Technical	Track record of contractor with respect to similar projects / contracts	List of past projects inclusive of a brief scope that will demonstrate your Company's' relevant experience in the successful completion of three (3) or more similar projects / similar scope of works: <ul style="list-style-type: none"> • 3 similar projects (6 marks) • 2 similar projects (4 marks) • 1 similar project (2 marks) Client References (4 marks)	10	7
Technical	The experience and knowledge of contractors' key personnel on the Project Team	Clear description of: <ol style="list-style-type: none"> 1. Organisational Chart of Project Team (5 marks) 	15	8



		<ol style="list-style-type: none"> 2. Project Role definition (2 marks) 3. Relevant qualifications and experience of Project Team {Project Manager/Engineer (2), HSSE lead (2), Licensed Electrician (1)} (5 marks) 4. Dated & signed CVs of each Personnel (listed above) in the Project Team (3 marks) 		
Technical	Conformance to Technical/ Performance Specifications	<ol style="list-style-type: none"> 1. Warranties: <ol style="list-style-type: none"> (a) Luminaires with accessories and controls - 10 years (2 marks) (b) TVSS - 5 years (1 mark) 2. Design (Conformance to Technical Field requirements and Specifications) <ol style="list-style-type: none"> (a) Match Field Illuminance (2 marks) (b) Athletic Field Illuminance (2 marks) 3. Operation <ol style="list-style-type: none"> (a) Dimming Control (4 marks) (b) IP Rating (1 mark) 4. Fixture Certification (1 mark) 5. Local Representative for supply of light fixture (2 marks) 	15	10
Technical	Methodology/Schedule	<ol style="list-style-type: none"> 1. Project-specific Methodology for undertaking the project (10 marks) <ol style="list-style-type: none"> (a) Submission of a method statement which covers the scope of works. (10 marks) (b) Submission of a method statement which does not cover approx. 75% of the scope of works (8 marks) (c) Submission of a method statement which does not cover approx. 50% of the scope of works (5 marks) (d) Submission of a method statement which does not cover approx. 25% of the scope of works (3 marks) (e) No Submission (0 marks) 2. Project-specific detailed Programme of Work (5) 3. Risk Assessment Strategy (3 marks) 4. Listing of Tools and Equipment to be used on site (2 marks) 	20	10
Technical	Health Safety Security & Environmental Plan & Quality Assurance	<ol style="list-style-type: none"> 1. Quality Manual and Policy Statement (5 marks) 2. Health, Safety & Environmental Manual and Policy Statement (5 marks) 	10	5



Financial	Financial Capability	1. Audited Financial Statements for the last 3 years (2023, 2022, & 2021) (9 marks) 2. Letter(s) of commitment from Bank (s) / Financial Institution that project can be financed. (1 marks)	10	5
Financial	Project Costing	Contractor's Price Proposal	20	-
Total Score			100	

***Only bidders obtaining the minimum score in each criterion in their Technical Submission will be further considered.**