

**SECTION 26 58 68
EXTERIOR ATHLETIC LIGHTING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sports luminaries and accessories
- B. Poles

1.2 REFERENCES

- A. ANSI C78.379 - Classification of Beam Patterns of Reflector Lamps
- B. ANSI C82.1 – For Lamp Ballasts - Line Frequency Fluorescent Lamps Ballast
- C. ANSI C82.4 - Ballasts for High – Intensity - Discharge and Low - Pressure Sodium Lamps (Multiple - Supply Type)
- D. NFPA 70 - National Electrical Code
- E. IES RP-6 - Sports and Recreational Area Lighting
- F. ASCE 7 – Minimum Design Loads for Buildings and Other Structures
- G. UL 489 – Molded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures
- H. IES TM-36-18 Technical Memorandum on the use of Solid State Lighting Applications

1.3 DESIGN REQUIREMENTS

- A. Design and layout lighting systems in conformance with IES recommended procedures for Sports lighting for Class II for Competition Play with Spectators.
- B. Contractor shall document the final light level and the Engineer of Record shall certify the document.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's data on sports lighting units including, but not limited to, poles and standards, mounting arm assemblies, brackets, lamps, lighting fixture-mounting heights, and wiring/cable connections.
- B. Shop Drawings: Submit dimensioned layout drawings of sports lighting units including poles and standards, mounting arm assemblies, brackets, lamps, lighting fixture mounting heights, and wiring/cable connections.
- C. The light levels shall meet IES recommended for Sports lighting.
 - 1. State the light levels in the numeric values. These values must be maintained and guaranteed for the length of the warranty from the manufacture only. Third party warranties will Not be Allowed. The manufacture must show proof of providing this level of warranty for at least 5 years. A list of 5 customers in Palm Beach County must be provided prior to approval.
 - 2. Provide computer generated point-by-point light scans based on LED technology.
 - 3. Stadium photometrics shall include bleachers and the tracks.
 - 4. Stadium bleachers shall have minimum of 10-footcandle lighting.
 - 5. Photometrics shall extend to 3'-0" minimum onto any adjacent residential property.
 - 6. Point by point data shall clearly indicated levels of spill lighting with proposed system.
 - 7. Manufacture to provide ITL or Certified candela reports for each fixture type provided on each lighting scan.
 - 8. Lighting Manufacture will provide Candella readings at each property line per field and provide in the case of Baseball -Softball candella values showing these values at home plate
 - 9. Manufacturers must provide a spreadsheet showing every Five years dates and times to check light levels and provide a report back to the school board showing compliance to the specifications. The school board Engineer must be notified before beginning testing
 - 10. Manufacture to provide Candella reading not to exceed 7500 on all property lines.

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11. Manufacture to provide contactor cabinets and controls to monitor when lights go out . System to be able to set schedules to turn on and off from a wireless system. Note turning on/off the lighting system with Breakers will not be allowed.

APPLICATION	INITIAL FOOTCANDLE LEVELS	MAINTAINED FOOTCANDLE LEVELS (0.8MF)	UNIFORMITY MAXIMUM	GRID
Stadium Field	50	50	2:1	30' x 30'
Stadium Track	30	30	4:1	30' x 30'
Baseball field	50	50	2:1	30' x 30'
Basketball Courts	50	50	2:1	10' x 10'
Tennis Court	30	30	2:1	20' x 20'

D. Concrete or Steel Pole Design

1. Submit engineering design calculations for the concrete or steel poles, including foundation design, designed by a structural engineer licensed by the State of Florida.
2. Base the wind loading design in accordance with the provisions of the FBC and ASCE 7.
3. Design shall account for supporting mounting arm assemblies, brackets, luminaires, etc.
4. Base pole foundations on the FBC provisions for poles embedded in earth employing lateral soil bearing.
5. Design calculations shall bear the impressed seal and original signature of the Specialty Engineer responsible for the design and licensed to practice by the State of Florida.
6. Specialty Engineer shall submit calculations in conformance with the Florida Department of Professional Regulation.

E. Geotechnical Report

1. Submit geotechnical engineering report indicating subsurface soil conditions and presenting the pole foundation design parameters.
2. Provide SPT soil boring data for at least four field locations within 25' of the proposed light poles to a depth of 15'.
3. Geotechnical report shall bear the impressed seal and original signature of the geotechnical engineer responsible for the report and licensed to practice by the State of Florida.

F. Certificates: Submit certificates and test reports indicating concrete 28-day compressive strength and pre-stress strand strength.

G. Manufacturer’s Warranty: Submit manufacturer’s warranty.

H. Provide 15-year warranty for the spots lighting system starting from date of project completion.

1. The manufacture only will Warranty the LED fixtures and system from failure for 15-years from date of project completion.
2. Replace and install at no cost to the Owner any system failure, which fails during the warranty period.
3. The manufacturer only shall warranty the alignment of the luminaire assembly for a period of 15 years from the date of installation against movement.
4. Labor charges for re-aiming during the warranty period are the manufacturer's responsibility.

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5. The warranty includes all: Parts, Labor, and Equipment (Cranes / Trucks) necessary to provide above warranty. Any Damage done on any school board property will be the responsibility of the Manufacture.
- 1.5 PROJECT RECORD DOCUMENTS
 - A. Submit under provisions of Section 01 77 00.
 - B. Accurately record the actual locations of each pole and luminaire.
 - 1.6 OPERATION AND MAINTENANCE DATA
 - A. Submit under provisions of Section 01 77 00.
 - B. Maintenance Data: Include instructions for maintaining luminaires.
 - 1.7 QUALIFICATIONS
 - A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 7 years of experience.
 - 1.8 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.
 - B. Accept products on site. Inspect for damage.
 - C. Protect poles from finish damage by handling carefully.
 - 1.9 COORDINATION
 - A. Furnish bolt templates and pole mounting accessories to installer of pole foundation

PART 2 PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
 - A. Furnish products as specified on Drawings.
 - B. Substitutions: Under provisions of Section 01 60 00
- 2.2 POLES AND OTHER REQUIREMENTS
 - A. Height as indicated on Drawings.
 - B. Hand hole
 - C. Removable weatherproof cover installed 18" + or - above finish grade.
 - D. Provide sports lighting units of sizes, types and ratings indicated, complete with, but not limited to, poles/standards, brackets, mounting arm assemblies, luminaires and other components and accessories required for complete lighting systems.
 - E. Prestressed Spun Concrete Lighting Standards: For stadium lighting, provide pre-stressed spun concrete, raceway-type lighting poles and standards of sizes and types indicated, comprised of shafts and brackets, and constructed with the following construction features:
 - F. Configuration
 1. Embedded type base and reinforcing sleeve with hand and cable entrance holes where indicated.
 2. Provide service platform for stadium poles and climbing rungs for all poles if needed
Manufacture is responsible to provide equipment necessary to perform there warranty for the length of time per this specification.
 - G. For baseball, softball, tennis, and basketball facilities provide standard pre-stressed concrete poles with similar features.
- 2.3 LIGHTING BRACKETS
 - A. Metal Brackets for Steel, Aluminum and Prestressed Concrete Lighting Standards:
 1. Provide corrosion-resistant, metal brackets, cantilevered without under braces, of sizes and styles indicated with attaching hardware.
 2. Construct in compliance with NEMA Pub Number SH5; and with the following construction features.

3. Material: Use a hot dipped galvanized steel process after unit fabrication.
 4. Thickness: Minimum is 3 Mills.
 - B. All hardware for mounting shall be Type 316 stainless steel.
- 2.4 LUMINAIRES
- A. General:
 1. Provide corrosion-resistant, aluminum luminaires of sizes, types, and styles indicated; equip with 5000 kelvin color temperatures LEDs, 480 line volts.
 - B. The aiming shall be factory pre-set and marked with visibly engraved process.
 1. Provide top-visor on all fixtures. Note Manufacture must comply with all of site vales and candles readings.
 2. Employ glare control equal to sports lighting fixtures in place at park adjacent to campus.
 3. The sports lighting shall not exceed one vertical foot-candle or ½ horizontal foot-candle on any residential property.
 4. Manufacture must provide showing compliance with International Dark Skies Community Friendly Outdoor Sports Lighting Program. The Manufacture is responsible for providing this document for each field or court provided.
 5. Lighting Program. The Manufacture is responsible for providing this document for each field or court provided.
 - C. Mount all Drivers remotely from the Fixture.
 1. All remote drivers shall be located in a driver enclosure located 15' above grade on the pole.
 - D. Each pole shall have located inside the driver enclosure, a lockable thermal disconnect device.
 - E. The pole, the cage, and the complete assembly must be UL listed, or OSHA approved.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine excavation and concrete foundation for sports lighting poles.
- B. Examine each luminaire to determine suitability for lamps specified.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install lighting poles at locations indicated.
- C. Embedded Luminaire Poles plumb and to the depth indicated on plans.
- D. Bond luminaires, metal accessories, and metal poles to the branch circuit equipment grounding conductor.
 1. Provide supplementary ground rod at each pole.
- E. Luminaire Pole Bases
 1. Size and constructed as indicated on Drawings.
 2. Project anchor bolts 3" minimum above base.
 3. Install poles on bases plumb; provide double nuts for adjustment.
 4. Grout around pole base.
 5. Provide manufacturer's covers for bolts at base.
- F. Adjust fixtures per the requirements of the aiming diagrams provided by fixture manufacturer.
- G. Provide all required conduit, wiring, junction boxes, contactors, and control panels for connection to a panel board provided by others.
 1. Feed each pole with 480v, 3-phase power from the location shown on the drawings.
- H. Poles shall not be located in front of stadium bleachers.

3.3 FIELD QUALITY CONTROL

- A. Upon completion the installation of the lighting, and after energizing the lighting circuitry with normal power source, test lighting system to demonstrate capability and compliance with requirements.
 - 1. The Manufacturer and Contractor in the presence of the Owner or his representative shall perform the tests.
 - 2. Where possible, correct malfunctioning units at the site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
 - B. Test and Measurement Procedures - Field Lighting:
 - 1. Complete all testing with entire facility illuminated.
 - 2. Horizontal Foot-candle Readings: The test cell shall be positioned horizontal
 - 3. 36" above the playing surface for all field foot-candle readings.
 - C. Take measurements during night sky, without moon or with heavy overcast clouds effectively obscuring moon.
- 3.4 ADJUSTING
- A. Adjust work under provisions of Section 01 77 00.
 - B. Aim and adjust luminaires to provide illumination levels and distribution as directed.
 - C. Replace LED fixture luminaries, which have failed lamps at Date of Substantial Completion.
- 3.5 CLEANING
- A. Molded Case Circuit Breakers: UL 489 provides circuit breakers with integral thermal and instantaneous magnetic trip in each pole.
- 3.6 DEMONSTRATION AND TRAINING
- A. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's Representative.
 - 1. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems.
 - 2. Schedule the instruction in coordination with the Owner's Representative after submission and approval of formal training plans.
 - 3. Refer to Section 01 91 00, Commissioning, for further contractor training requirements.
 - B. Provide demonstration and training for all types of sports lighting equipment installed in this project.

END OF SECTION