

# **2012 Little League® Lighting Standards & Safety Audit**



Excerpted from the Little League® 2012 Operating Manual



# TABLE OF CONTENTS

|  |       |
|--|-------|
| Introduction                                   | 4     |
| I. Required Minimum Standards                  |       |
| Part 1 - General                               |       |
| 1.1 Lighting Performance                       | 5     |
| 1.2 Environmental Light Control                | 6     |
| 1.3 Life-Cycle Costs                           | 6     |
| 1.4 Warranty and Guarantee                     | 6     |
| Part 2 - Product                               |       |
| 2.1 Lighting System Construction               | 7     |
| 2.2 Structural Parameters                      | 8     |
| Part 3 - Execution                             |       |
| 3.1 Field Quality Control                      | 8     |
| 3.2 Ongoing Quality Assurance                  | 9     |
| II. Desirable Features                         |       |
| 4.1 Controls & Monitoring System               | 9     |
| 4.2 Auxiliary Brackets                         | 9     |
| 4.3 Field Perimeter Lighting                   | 9     |
| III. Life-Cycle Operating Cost Evaluation      | 10    |
| IV. Little League Lighting Standards Checklist | 11    |
| V. Facility Drawings                           | 12–13 |
| VI. Safety Audit                               | 14–17 |

# Artificial Lighting

Night games have been permitted in Little League starting in 1957 with the second Little League International Congress in Chicago. Standards set by the Illuminating Engineering Society (IES) of North America were adopted by Little League Baseball in 1957, and have been updated with recommendations from the National Electric Code, the Uniform Building Code, and others.

Over the years, these standards have been refined and have been adopted by Little League Baseball, the National Recreation Society and other organizations. **THE IMPORTANCE OF ADHERING TO THESE STANDARDS CANNOT BE UNDERSTATED, TO ASSURE THE UNIFORMITY OF LIGHTING LITTLE LEAGUE FIELDS MAKES THE GAME SAFER FOR CHILDREN AND VOLUNTEERS. ALL LIGHTING SYSTEMS MUST COMPLY WITH LITTLE LEAGUE STANDARDS, WITHOUT REGARD TO WHO INSTALLS OR FINANCES THE SYSTEM** (such as city, county, private individual, etc.).

Many leagues operate in conjunction with other organizations or municipalities. This does not need to be a roadblock in making sure that standards are met. Instead, it is a matter of educating people at all levels on this vital aspect of league operations.

The District Administrator (and each local Little League President) are directly responsible for ensuring that any fields on which night games are played within his/her league or district are up to these standards. The potential liability risks we all face makes compliance even more imperative.

As the Little League program grows and leagues charter more divisions, the demand for fields increases dramatically. For many leagues, a less costly alternative to constructing new fields is the installation of artificial lighting, providing optimum use of available fields within the curfew limitations for each division. In planning for artificial lights, it is most important that minimum lighting standards be attained. Every precaution should be taken to guard against mishaps that might result because of the installation of an inadequate lighting system. **The local district administrator must pre-approve plans for any new lighting system as being adequate and within minimum standards for safe play.** It is recommended that the District Administrator involve the lighting specialist in Williamsport in his/her review. The District Administrator and President of the league must check the system after installation to determine that the installed system complies with the plans and meets or exceeds the minimum standards for play. Lighting systems must be checked once per year, and should be done before the season begins. Copies of project plans must be submitted to the District Administrator, for prior approval that the plans and installation comply with required standards.

The following standards have been adopted by Little League. They are divided into required minimum standards and desirable optional features. The minimum standards establish criteria which are important to the safe conduct of Little League activities. The desirable features are established to provide guidelines for adding important value to your lighting system.

Lighting systems installed prior to July 1, 1992 on fields with outfield fences 200 feet or less from home plate are temporarily "grandfathered" if they have a minimum of 24 -- 1500 watt metal halide fixtures mounted a minimum of 40 feet above the playing surface on four poles or more. These systems must provide a minimum average maintained illumination of 30 footcandles in the infield and 20 footcandles in the outfield. Since September, 1994, wood poles are not approved for use on Little League fields.

**Notice:** Any upgrade or addition of lighting equipment to existing systems after July 1, 1992, must be done so that the systems will be in complete compliance with current standards.

# Standards for Lighting

## I. Required Minimum Standards

These minimum standards are required for all lighting installations after the date of adoption of these standards. Any modification in existing lighting systems after this date should be done so as to result in a lighting system in compliance with these standards. To be in compliance, a system must meet all required minimum standards.'

### PART 1 – GENERAL

#### 1.1 LIGHTING PERFORMANCE

##### **A. Light Levels – Optic System Performance**

The quantity of equipment needed to produce the target light levels on a field is determined by the efficiency of the lighting system. Newest technology is capable of delivering equal or better results with as little as half the amount of equipment as common floodlighting systems. This generation of lighting has high performance optic characteristics that enable reductions in the quantities of luminaires needed to meet design targets. The lighting designs for the specified field will show a reduced fixture count for systems using a high-performance optic system. Manufacturers should provide assurance that target light levels will be met over the life of the system.

##### **B. Light Levels – Sustaining Targets Over Time**

The two methods of design to meet specified light levels are: to provide a constant light level during the guarantee period, or to apply a recoverable light loss factor to the initial design.

##### **1. Preferred Technology**

By using a series of automatic power adjustments, a lighting system is able to provide “constant light levels” and greatly extend the life of the lamps. The basics of this method are described under “Lumen Maintenance” in the IESNA Lighting Handbook Reference and Application, Ninth Edition, page 27-2 and 27-3: “Lumen maintenance control strategy calls for reducing the initial illumination of a new system to the designed minimum level. As lumen depreciation occurs, more power is applied to the lamps in order to maintain constant output.”

The term constant is intended to include any system that provides target light levels at 100 hours and maintains the target light levels throughout the system life. Light levels should be guaranteed for 25 years with this technology.

Manufacturers should provide an independent test report signed by a licensed professional engineer certifying the lumen maintenance strategy and field performance of any constant light system

##### **2. Floodlighting with a Recoverable Light Loss Factor**

Computer designs are done using two sets of values. One shows the calculated “initial light levels” when lamps are new. The other predicts “target maintained light levels” after the lamps have passed through depreciation in light output. It is important to have the lighting designer use a maintenance factor adequate to account for this depreciation in light output throughout the life of the lamp.

According to best sports lighting practices, the recoverable light loss factor, or the value applied to the initial light level to predict the maintained light level values, should be in accordance with recommendations in the Pennsylvania State University report “Light Loss Factors for Sports Lighting,” published in IES’s Leukos, Vol. 6, No. 3, Jan., 2010, pages 183-201. The report’s findings show a recoverable light loss factor of 0.69 should be used if lamps will be replaced at 2100 hours. If lamps will be replaced at a different interval, the following chart from the report should be used to determine the appropriate recoverable light loss factor. Quality manufacturers are willing to provide guarantees of lighting performance.

| <b>Group Lamp Replacement Interval</b> | <b>Recoverable Light Loss Factor</b> |
|--|--------------------------------------|
| 750 hours                              | 0.80                                 |
| 1200 hours                             | 0.75                                 |
| 2100 hours                             | 0.69                                 |
| 3000 hours                             | 0.65                                 |

**C. Performance Requirements — Quantity**

Playing surfaces shall be lit to an average target light level and uniformity as specified in the following chart. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified beginning on page 13 of these standards with the light meter held horizontally 36 inches above the field surface. Measured average illumination level shall be measured at the first 100 hours of operation.

**D. Performance Requirements — Quality**

Uniformity of the lighting shall be such that the highest measure of quantity of light on the field is not greater than the lowest measurement per the ratio listed in the table below. On the entire field area, the change in the quantity of horizontal footcandles should not occur at a greater rate than 10 percent per 10 feet, except for the outside perimeter readings which may change at a greater rate.

| Level of Play/Description | Average Constant or Target Light Levels (Horizontal)  | Maximum to Minimum Uniformity Ratio | Maximum Rate of Change |
|---------------------------|---|-------------------------------------|------------------------|
| Standard — Competition    | 50 footcandles – Infield<br>30 footcandles – Outfield | 2:1 – Infield<br>2.5:1 – Outfield   | 10% per 10 feet        |

**E. Glare for Participants**

To achieve placement of lights in positions that enhance playability, pole heights, pole locations, and fixture placements should be as shown on the layouts in the appendix.

**1.2 ENVIRONMENTAL LIGHT CONTROL**

Many facilities are located near residential or commercial properties or roadways, creating the possibility of spill and glare onto adjoining properties. Consideration should be given to this issue during the initial lighting design stage to minimize this effect. Some communities are implementing ordinances designed to minimize light pollution. Contact your local planning committee or zoning board.

The lighting equipment manufacturer can assist in assessing this issue and provide drawings showing maximum footcandles at any points of concern on adjacent properties. Do not hesitate to investigate a manufacturer’s reputation, abilities and past experiences in working with local authorities and private property owners regarding glare and spill issues.

**1.3 LIFE-CYCLE COSTS**

Leagues continue to struggle with operating budgets. Because the efficiency of lighting systems currently available can vary greatly, a life-cycle operating cost analysis should be considered when evaluating lighting systems. Owners should expect a quality lighting system to last a minimum of 25 years.

These standards provide a Life-Cycle Operating Cost Evaluation form to assist with the process. Items that should be included are energy consumption based upon the facility’s expected usage, cost for spot relamping and maintenance, and any additional savings in energy or labor cost provided by automated on/off control systems. Contract price and life-cycle operating cost should both be considered in determining a lighting manufacturer for the project.

**1.4 WARRANTY AND GUARANTEE**

Product warranties are a good gauge of a manufacturer’s confidence in their products. Prior generation equipment can range from 5 years to 10 years, and details of covered items and conditions vary greatly. New generation technology comes with warranty periods that may extend up to 25 years and includes guaranteed light levels, parts, labor, lamp replacements, energy usage, monitoring and control services, spill light control and structural integrity. The manufacturer should provide specially-funded reserves to assure fulfillment of the warranty for the full term. It is highly recommended you consider these all-inclusive warranties to limit your league’s future exposure to escalating costs and maintenance hassle.

## **PART 2 – PRODUCT**

### **2.1 LIGHTING SYSTEM CONSTRUCTION**

A lighting system should consist of lighting, electrical and structural components designed to work together as a system that is durable and provides safety features.

#### **A. Outdoor lighting systems should consist of the following:**

1. Galvanized steel poles and crossarm assembly. Wood poles are not allowed after September 1, 1994. Based on current data, Little League does not recommend direct burial of steel poles because of the potential for deterioration at or below ground at critical stress points. If direct bury steel poles are used, leagues should have a foundation design completed by a structural engineer. Poles should be hot-dip galvanized to ASTM-123 standards. All accompanying hardware shall be galvanized or stainless steel.
2. Reinforced concrete pole foundation. Foundations should provide for pole attachment a minimum of 18 inches above ground to avoid corrosive deterioration. Concrete should cure a minimum of 28 days to develop adequate strength before stress loads are applied.
3. All ballasts and supporting electrical equipment shall be mounted onto the pole, away from the fixtures and crossarm to avoid problems of misalignment caused by the weight of these components. It is recommended that this equipment be placed in aluminum enclosures mounted remotely approximately 10' above grade. The enclosures shall be lockable and include ballast, capacitor and individual fusing for each luminaire. Safety disconnect per circuit for each pole structure will be located in the enclosure. Enclosures should be kept locked except during times of maintenance.
4. All wiring conductors above ground must be in enclosed in rigid cover. It is recommended that the lighting system include a wire harness complete with an abrasion protection sleeve, and strain relief.
5. The approved lamp for Little League play is a 1500-watt metal halide. Lamps must have an ASNI code – M48PC-1500/BU. Musco/Philips, Sylvania, and General Electric are the only manufacturers currently approved.
6. The lighting and electrical equipment on each ball field lighting structure shall have a UL Listing to confirm that the equipment has passed the safety tests of Underwriters Laboratory not only as to the individual components but also as to the use of the components in the configuration of the lighting system on the field.

#### **B. Manufacturing Requirements**

It is recommended that all components be designed and manufactured as a system. All luminaires, wire harnesses (if provided), ballast and other enclosures should be factory assembled, aimed, wired and tested for reduced installation time and trouble-free operation.

#### **C. Durability**

It is recommended that all exposed components be constructed of corrosion resistant material and/or coated to help prevent corrosion. Look for items like hot dip galvanizing for steel poles, stainless steel fasteners, powder coat painted aluminum and wiring enclosed within the crossarms, conduit, pole or electrical enclosure.

#### **D. Lightning Protection:**

All outdoor structures need to be equipped with lightning protection meeting NFPA 780 standards. In many instances the supplemental ground may not provide adequate lightning ground, creating the potential for a faulty electrical system in the case of a lightning strike.

#### **E. Safety**

All system components need to be UL Listed for the appropriate application. All electrical conductor wires for distribution of power around the playing field should be buried underground at depths provided by local code.

**F. Maximum total voltage drop**

Voltage drop to the disconnect switch located on the poles should not exceed three (3) percent of the rated voltage per IESNA RP-6-01.

**2.2 STRUCTURAL PARAMETERS**

**A. Location**

Poles shall be located as shown on the drawings in the appendix to these standards. Whenever possible, poles should be located outside of fences to avoid causing an obstruction or safety hazard to the participants.

**B. Foundation Strength**

Project specific foundation drawings stamped by a licensed structural engineer illustrating that the foundation design is adequate to withstand the forces imposed from the pole, fixtures and other attachments to prevent the structure from leaning.

**C. Support Structure Wind Load Strength**

Poles and other support structures, brackets, arms, bases, anchorages and foundations shall be determined based on the 50 year mean recurrent isotach wind maps for the appropriate county per the State Building Code.

**D. Structural Design**

The stress analysis and safety factor of the poles shall conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

**E. Soil Conditions**

The design criteria for these specifications are based on soil design parameters as outlined in the geotechnical report. If a geotechnical report is not provided by the school, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2001 IBC, Table 1804.2-I-A.

**PART 3 – EXECUTION**

**3.1 FIELD QUALITY CONTROL**

**A. Illumination Measurements**

Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, League Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA RP-6-01, Appendix B.

**B. Correcting Non-Conformance**

If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios and maximum kilowatt consumptions are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be liable to any or all of the following:

1. Manufacturer shall, at his expense, provide and install any necessary additional fixtures to meet the minimum lighting standards. The Manufacturer shall also either replace the existing poles to meet the new wind load (EPA) requirements or verify by certification by a licensed structural engineer that the existing poles will withstand the additional wind load.
2. Manufacturer shall minimize the Owner's additional long term fixture maintenance and energy consumption costs created by the additional fixtures by reimbursing the Owner the amount of \$1,000 (one thousand dollars) for each additional fixture required.
3. Manufacturer shall remove the entire unacceptable lighting system and install a new lighting system to meet the specifications.

### **3.2 ONGOING QUALITY ASSURANCE**

- A.** Full light and safety audits should be performed every year. See Lighting Safety Audit at the back of these standards.

## **II. Desirable Features**

The following practices are recommended for increasing the lighting system performance.

### **4.1 CONTROLS AND MONITORING SYSTEM**

A remote controls and monitoring system will provide ease of operation and management for your facility. Manufacturers providing systems with a 25 year warranty will utilize this system to ensure your lighting performs as required.

#### **A. Remote Monitoring**

Monitoring systems can check the lighting system each time it is turned on for luminaire outages. When an outage is detected, the manufacturer should notify the owner within one business day so that appropriate maintenance can be scheduled.

#### **B. Remote Lighting Control**

Lighting control systems allow owners and users with a security code to schedule on/off system operation in a variety of methods including web sites, phone, fax or email. Look for manufacturers that provide trained staff available 24/7 to provide scheduling support. Also evaluate features such as memory back up in the event of power outages.

#### **C. Management Tools**

Some manufacturers provide a web-based database of actual field usage and provide reports by facility and user group.

#### **D. Communication Costs**

Leagues should request that manufacturers include communication costs for operating the controls and monitoring system for the life of the lighting system.

### **4.2 AUXILIARY BRACKETS**

Sports lighting manufacturers can provide accommodations for mounting auxiliary equipment such as speakers on sport lighting poles. This ensures poles will be sized to accommodate the weight, dimensions and EPA of the additional equipment. Brackets shall be welded to the pole and fabricated from hot-dip galvanized steel with a covered hand hole access and internal wiring in the pole.

### **4.3 FIELD PERIMETER LIGHTING**

The parking areas, major areas utilized for passage, and areas immediately bordering the facilities should be lighted to an average of approximately 2 footcandles. Care should be taken to eliminate darkly shadowed areas.

**For additional information, contact: Little League® Baseball and Softball International  
PO Box 3485  
Williamsport, PA 17701  
570/326-1921  
Fax: 570/326-1074**

## LIFE-CYCLE OPERATING COST EVALUATION

*This form will assist you in comparing 25-year life-cycle operating costs from multiple manufacturers. Bid proposals should be evaluated based upon compliance with the specifications, contract price and the following life-cycle operating cost evaluation.*

### BID ALTERNATE A:

|           |   |   |  |
|-----------|---|---|--|
| <b>A.</b> | <b>Energy consumption</b><br>____ Number of luminaires x ____ kW demand per luminaire x ____ kW rate x<br>____ annual usage hours x 25 years            |   |  |
| <b>B.</b> | <b>Demand charges, if applicable</b>  | + |  |
| <b>C.</b> | <b>Spot relamping and maintenance over 25 years</b><br>Assume ____ repairs at \$ ____ each if not included  | + |  |
| <b>D.</b> | <b>Group relamps during 25 years</b><br>____ annual usage hours x 25 years / <u>lamp replacement hours</u> x \$125 lamp &<br>labor x number of fixtures | + |  |
| <b>E.</b> | <b>Extra energy used without control system</b><br>____% x Energy Consumption in item A.  | + |  |
| <b>F.</b> | <b>Extra labor without control system</b><br>\$ ____ per hour x ____ hours per on/off cycle x ____ cycles over 25 years                                 | + |  |
| <b>G.</b> | <b>TOTAL 25-Year Life-Cycle Operating Cost</b>  |   |  |

### BID ALTERNATE B:

|           |   |   |  |
|-----------|---|---|--|
| <b>A.</b> | <b>Energy consumption</b><br>____ Number of luminaires x ____ kW demand per luminaire x ____ kW rate x<br>____ annual usage hours x 25 years            |   |  |
| <b>B.</b> | <b>Demand charges, if applicable</b>  | + |  |
| <b>C.</b> | <b>Spot relamping and maintenance over 25 years</b><br>Assume ____ repairs at \$ ____ each if not included  | + |  |
| <b>D.</b> | <b>Group relamps during 25 years</b><br>____ annual usage hours x 25 years / <u>lamp replacement hours</u> x \$125 lamp &<br>labor x number of fixtures | + |  |
| <b>E.</b> | <b>Extra energy used without control system</b><br>____% x Energy Consumption in item A.  | + |  |
| <b>F.</b> | <b>Extra labor without control system</b><br>\$ ____ per hour x ____ hours per on/off cycle x ____ cycles over 25 years                                 | + |  |
| <b>G.</b> | <b>TOTAL 25-Year Life-Cycle Operating Cost</b>  |   |  |

## Little League® Lighting Standards Checklist Design Submittal Data Checklist and Certification

*This form will assist you in comparing proposals from various lighting manufacturers. All items listed below should comply with your project's specifications and be submitted according to your pre-bid submittal requirements.*

| Included | Tab      | Item                                     | Description  |
|----------|----------|--|--|
|          | <b>A</b> | Letter/Checklist                         | Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.  |
|          | <b>B</b> | On Field Lighting Design                 | Lighting design drawing(s) showing:<br>a. Field name, date, file number, prepared by, and other pertinent data<br>b. Outline of field(s) being lighted, as well as pole locations referenced to home plate. Illuminance levels at grid spacing specified<br>c. Pole height, number of fixtures per pole, as well as luminaire information including wattage, lumens and optics<br>d. Height of meter above field surface should be 36 inches<br>e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance and uniformity gradient; number of luminaires, total kilowatts, average tilt factor; light loss factor.<br>f. Manufacturers shall provide constant light level or provide both initial and maintained light scans using a maximum 0.69 Recoverable Light Loss Factor and lamp replacement interval at 2100 hours to calculate maintained values as shown in section 1.1.B.2 of these standards. |
|          | <b>C</b> | Off Field Lighting Design                | Lighting design drawings showing spill light levels in footcandles as specified.   |
|          | <b>D</b> | Photometric Report (glare concerns only) | Provide photometric report for a typical luminaire used showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.  |
|          | <b>E</b> | Life Cycle Cost calculation              | Document life cycle cost calculations as defined on the Life Cycle Operating Cost Evaluation. Identify energy costs for operating the luminaires, maintenance cost for the system including spot lamp replacement, and group relamping costs. All costs should be based on 25 Years.   |
|          | <b>F</b> | Luminaire Aiming Summary                 | Document showing each luminaire's aiming angle and the poles on which the luminaires are mounted. Each aiming point shall identify the type of luminaire.  |
|          | <b>G</b> | Structural Calculations (if required)    | Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state where the project is located.   |
|          | <b>H</b> | Control and Monitoring                   | Manufacturer shall provide written definition and schematics for automated control system to include monitoring. They will also provide examples of system reporting and access for numbers for personal contact to operate the system.  |
|          | <b>I</b> | Electrical distribution plans            | If bidding a system other than the base design, manufacturer must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state where the project is located.  |
|          | <b>J</b> | Performance Guarantee                    | Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed per the number of years specified.   |
|          | <b>K</b> | Warranty                                 | Provide written warranty information including all terms and conditions.   |
|          | <b>L</b> | Project References                       | Manufacturer to provide a list of project references of similar products completed within the past three years.  |
|          | <b>M</b> | Product Information                      | Complete set of product brochures for all components, including a complete parts list and UL Listings.   |
|          | <b>N</b> | Non-Compliance                           | Manufacturer shall list all items that do not comply with Little League Lighting Standards.  |
|          | <b>O</b> | Compliance                               | Manufacturer shall sign off that all requirements of the specifications have been met at that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in item N – Non-Compliance   |

**Manufacturer:** \_\_\_\_\_

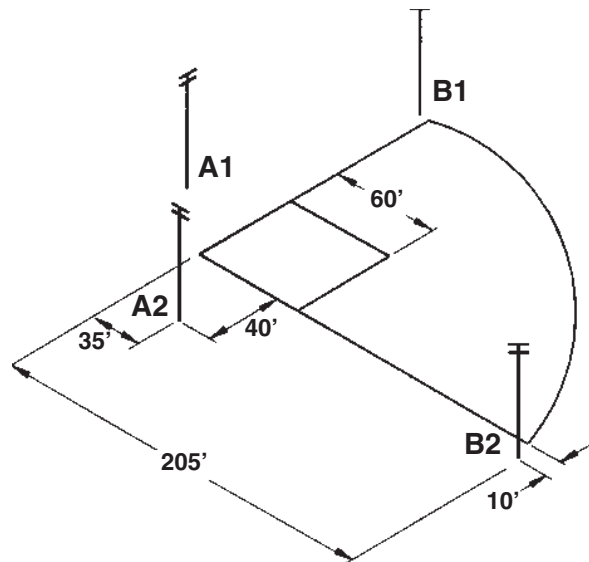
**Signature:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

# Lighting Diagrams

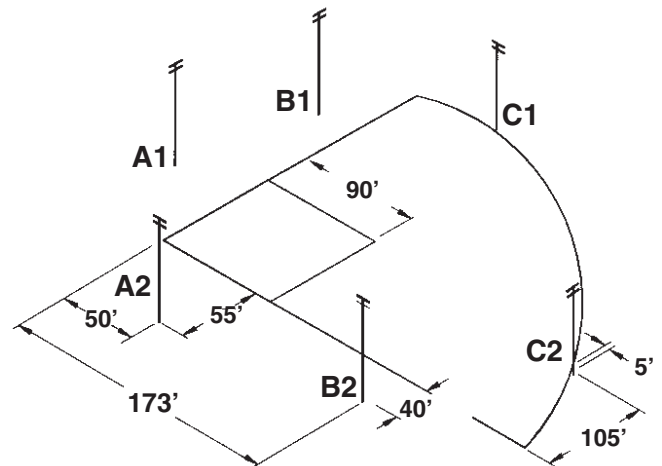
| Layout for 200' radius field |                  |                    |
|------------------------------|------------------|--------------------|
| Poles                        |                  |                    |
| Location                     | Minimum Quantity | Minimum Mtg. Ht. † |
| A                            | 2                | 60'                |
| B                            | 2                | 60'                |
| <b>Total</b>                 | <b>4</b>         |                    |



This layout is based on the following total playing area including a strip 20 feet wide outside each foul line. Infield area – 10,000 square feet. Outfield area – 30,000 square feet (approximately).

**LITTLE LEAGUE** – 60 foot base lines; outfield fence 200 feet from home plate.

| Layout for 300' radius field |                  |                    |
|------------------------------|------------------|--------------------|
| Poles                        |                  |                    |
| Location                     | Minimum Quantity | Minimum Mtg. Ht. † |
| A                            | 2                | 70'                |
| B                            | 2                | 70'                |
| C                            | 2                | 60'                |
| <b>Total</b>                 | <b>6</b>         |                    |



This layout based on: Infield area – 22,500 square feet. Outfield area – 67,500 square feet (approximate); including a strip 30 feet wide outside each foul line.

**SENIOR LEAGUE AND BIG LEAGUE** – 90 foot base lines; outfield fence 300 feet from home plate.

## NOTES:

\* The number of fixtures necessary to meet minimum lighting requirements varies between manufacturers. Please be sure you are provided adequate documentation from the manufacturer showing Little League standards will be attained.

† For glare control taller fixture mounting heights may be required. Also, if obstructions or common poles for multiple fields require poles to be set back farther from the field, then taller poles may be required.

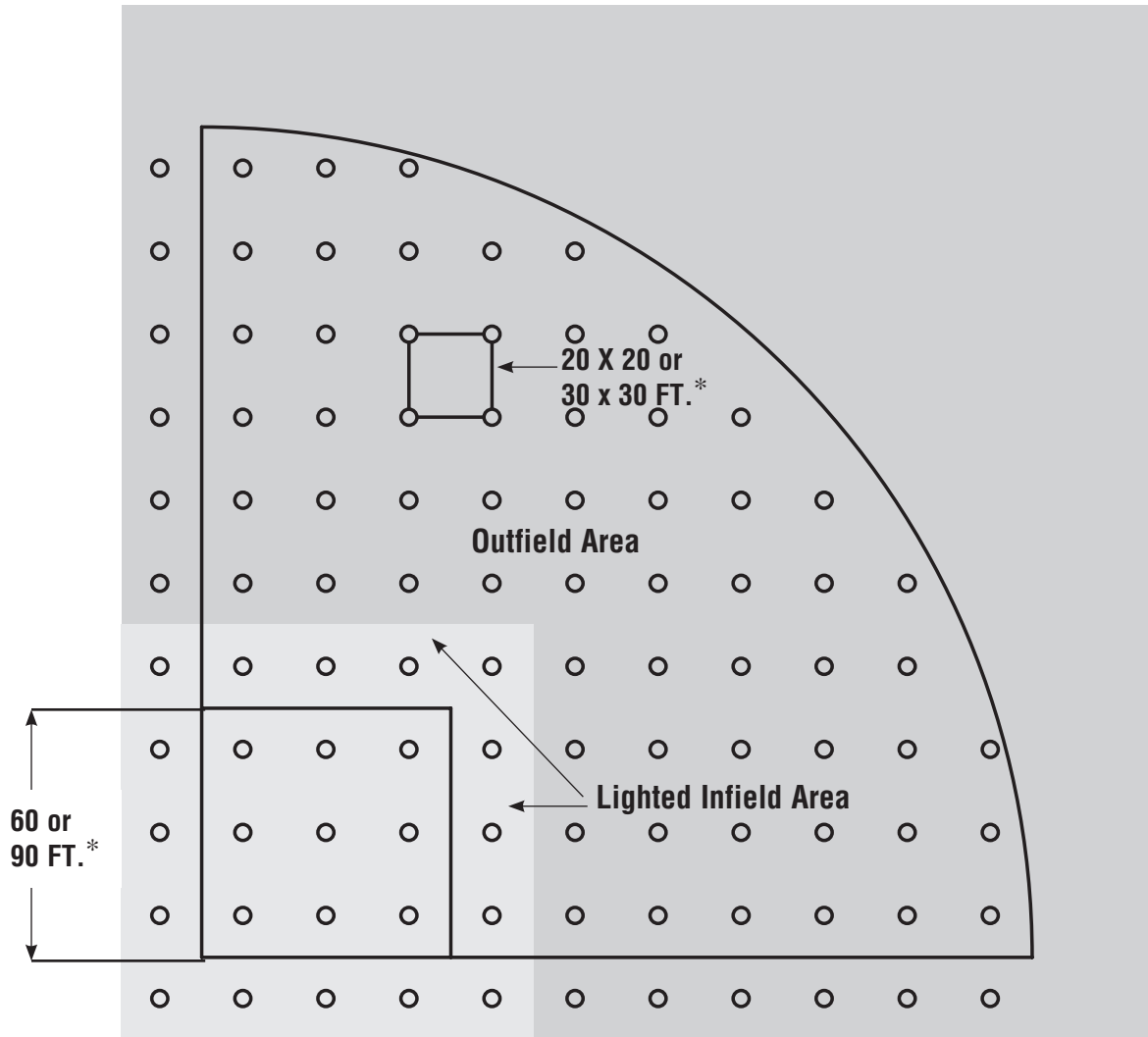


Fig. B4. Illuminance measuring points for baseball and softball. **Illuminating Engineering Society of North America Sports Lighting-RP-6-01**

| Field Size | Base Paths | Grid Spacing      | Total Number of Grid Points |          |
|------------|------------|-------------------|-----------------------------|----------|
|            |            |                   | Infield                     | Outfield |
| 175-foot   | 60-foot    | 20-foot x 20-foot | 25                          | 54       |
| 200-foot   | 60-foot    | 20-foot x 20-foot | 25                          | 73       |
| 300-foot   | 90-foot    | 30-foot x 30-foot | 25                          | 73       |

Light meter should be held horizontally at 36 inches above the surface.



# Little League®

# Lighting Safety Audit

Little League requirements call for regular inspections of your lighting system. The following safety audit will:

1. Identify components that may need repair or replacement.
2. Help you determine whether the performance of the system meets Little League minimum standards as outlined in the Standards of Artificial Lighting section of the Little League Operating Manual.

A copy of this completed form must be sent to your District Administrator and the original should be retained in league records.

**Important - Inspection, testing and repair must be done by qualified person prior to season play each year.**

**Plans for new lighting must be approved by local District Administrator as being within minimum standards.**

For additional information contact your District Administrator or Little League Headquarters.

|   |
|---|
| League Name _____                       |
| Charter No. _____ - _____ - _____       |
| Town _____ State _____                  |
| Number teams in league _____            |
| Name of field _____                     |
| Number leagues using field _____        |
| We share the field with _____ League    |
| Total # of fields _____ # lighted _____ |
| Date of Inspection _____                |
| Inspected by _____                      |
| Testing & Repairs by _____              |

# Lighting Performance

This field has the following light levels and uniformity:

Infield \_\_\_\_\_ Average footcandles  
 \_\_\_\_\_ :1 Uniformity

Outfield \_\_\_\_\_ Average footcandles  
 \_\_\_\_\_ :1 Uniformity

Date lighting equipment installed or last upgraded  
 \_\_\_\_\_  
 month / year

Readings are taken in the middle of each square represented on the chart below.

**To obtain average footcandle value:**

1. Record light readings within each numbered square.
2. Infield = Total of infield readings ÷ 25
3. Outfield = Total of outfield readings ÷ number of readings.

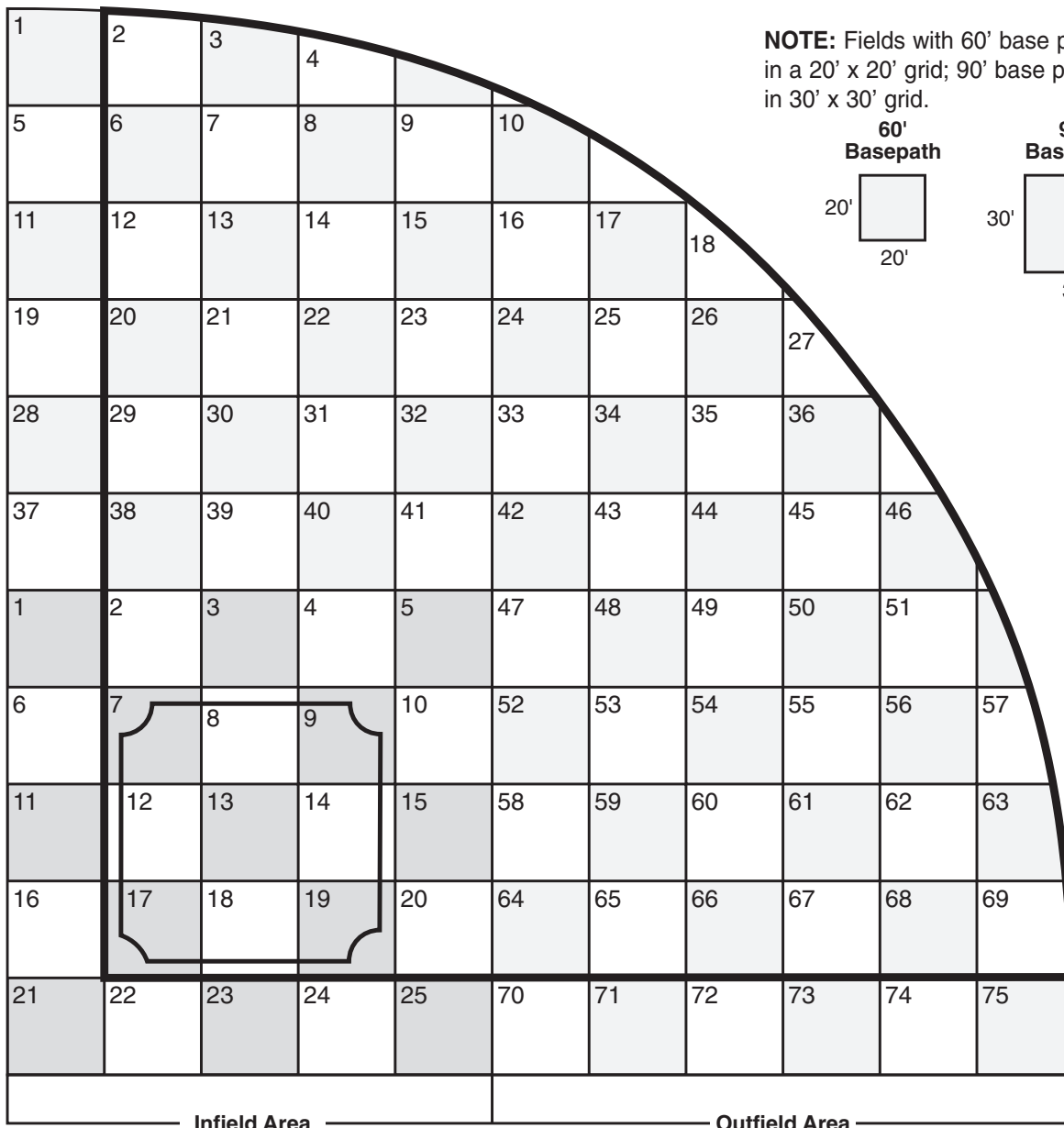
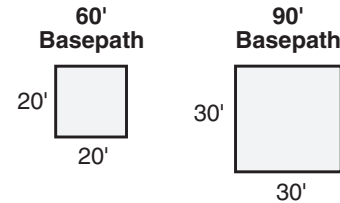
**To obtain uniformity ratio for infield or outfield:**

1. Divide highest (maximum) light level reading by the lowest (minimum) light level reading.

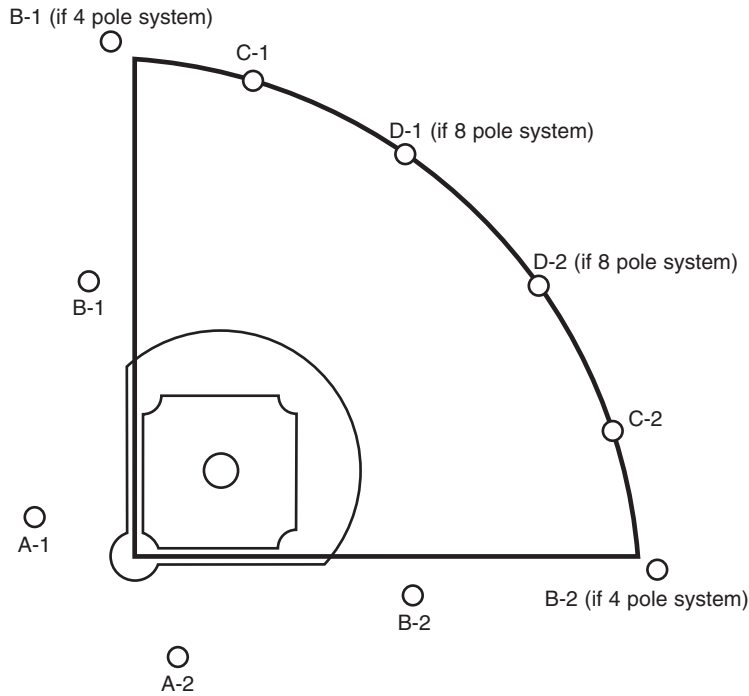
**For example:**

$$\frac{61 \text{ footcandles (infield maximum)}}{\div} \frac{31 \text{ footcandles (infield minimum)}}{=} 2:1$$

**NOTE:** Fields with 60' base paths are measured in a 20' x 20' grid; 90' base paths are measured in 30' x 30' grid.



# Equipment Listing



Fill in the number of fixtures on each pole and mounting heights:

|               | Pole | Number of Fixtures |
|---------------|------|--------------------|
| 4 Pole System | A-1  | _____              |
|               | A-2  | _____              |
|               | B-1  | _____              |
|               | B-2  | _____              |
| 6 Pole System | C-1  | _____              |
|               | C-2  | _____              |
| 8 Pole System | D-1  | _____              |
|               | D-2  | _____              |
| <b>Total</b>  |      | _____              |

Type of poles:  wood\*  steel  concrete  
 Fixture height above field: \_\_\_\_\_  
 Base path length:  60'  90'  
 Distance from home plate to foul pole:  
 175'  200'  300'  other \_\_\_\_\_

\*Note: Wood poles permissible only if installed prior to September 1, 1994

## Lamp Type:



High Pressure Sodium



Quartz Incandescent



Incandescent



Metal Halide

# Grounding System Test

THREE POINT GROUND ROD RESISTANCE TEST\* - This test measures the resistance of the ground rod to earth. This method also measures the effect of a variety of conditions such as soil composition, drought conditions, etc. A direct-reading instrument called a Groundohmer or Groundometer is used for the following testing procedure:

- Two additional temporary grounds, consisting of short rods 2–3 feet long, must be driven in the ground at least 20 feet away from the ground being tested.
- The instrument is connected to all three grounds by means of insulated leads. A magneto or a battery in the instrument furnishes the necessary power for the test.
- The instrument reads the ground resistance directly in ohms.

**NOTE:** The National Electrical Safety Code (NEC) implies that the ground resistance should be measured at the time of installing the ground and that the ground resistance must not exceed 25 ohms for artificial (buried or driven) grounds.

\* American Electricians Handbook procedure

It is recommended that testing procedures for grounding be in accordance with local, state, or national code.

# System Operation

OK Needs Repair

Notes:

WARNING!! Turn off electricity at power source and at safety disconnect on the pole.

| <b>Service Entrance &amp; Pole Distribution Boxes</b>  |  | OK | Needs Repair | Notes: |
|--|--|----|--------------|--------|
| <b>Check service panel for proper markings.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Emergency information should be visible.</li> <li>Warning stickers, wiring diagrams, circuit labels and other servicing information signs should be posted and clearly legible.</li> </ul>  |  |    |              |        |
| <b>Test reset action on all service breakers.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Snap all breakers on and off several times to ensure firm contact.</li> <li>If fuses are used at main service, check continuity.*</li> </ul>  |  |    |              |        |
| <b>Check the wiring.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Insulation around wiring should show no signs of deterioration.</li> <li>Wiring should show no heat discoloration.</li> </ul>   |  |    |              |        |
| <b>Check all taped connections.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Signs of wear should be replaced.</li> </ul>  |  |    |              |        |
| <b>Make sure no live parts are exposed.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Bare wires and exposed connections should be wrapped with insulated covering.*</li> </ul>   |  |    |              |        |
| <b>Padlocks for service entrance &amp; distribution boxes should be in place and operational.</b>  |  |    |              |        |
| <b>Poles - Annual Testing</b>  |  | OK | Needs Repair | Notes: |
| <b>Check to see that poles aren't leaning.</b>   |  |    |              |        |
| <b>Check wood poles for decay or twisting. Twisted pole may require re-aiming of fixtures.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Effective Sept. 1, 1994 wood poles are no longer approved on new installations.</li> </ul>  |  |    |              |        |
| <b>Check base-plate of steel poles for signs of deterioration.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Check anchor bolt for signs of corrosion.</li> <li>Check grouting under pole to make sure proper drainage exists.</li> </ul>  |  |    |              |        |
| <b>Check bolts and fittings for tightness.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Check all metal parts for signs of corrosion.</li> </ul>  |  |    |              |        |
| <b>Check to see that wiring covers are in place.</b>   |  |    |              |        |
| <b>Check all cables and conduits.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Pull on conduit to check for looseness.</li> <li>Check for loose fittings and damaged conduit.</li> <li>All cables should be straight and properly strapped.*</li> <li>If cables are exposed to the elements, make sure the insulation has the proper rating.*</li> </ul> |  |    |              |        |
| <b>Check overhead wiring.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Wiring should be properly secured</li> <li>Check that new growth on tree branches and limbs won't obstruct or interfere with overhead wiring.</li> </ul>  |  |    |              |        |
| <b>Luminaires</b>  |  | OK | Needs Repair | Notes: |
| <b>Check fixture housings.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Housings should show no sign of cracking and/or water leakage.</li> </ul>   |  |    |              |        |
| <b>Check lenses.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Clean lenses.</li> <li>Replace broken lenses.</li> </ul>  |  |    |              |        |
| <b>Replace burned-out lamps.</b>   |  |    |              |        |
| <b>Check luminaire fuses.</b>  |  |    |              |        |
| <ul style="list-style-type: none"> <li>Replace burned-out fuses.</li> <li>Fuses should be the correct size.</li> <li>All fuses should be operational.</li> </ul>   |  |    |              |        |
| <b>Insulation covering on wiring should show no signs of wear or cracking.</b>   |  |    |              |        |
| <b>Ground wire connections must be secure.</b>   |  |    |              |        |
| <b>Check around ballasts for signs of blackening.</b>  |  |    |              |        |
| <b>Check that capacitors aren't bulging.</b>   |  |    |              |        |
| <b>Check aiming alignment of all fixtures.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>On wooden poles, see if crossarms are still aligned with the field and horizontal.</li> </ul>   |  |    |              |        |
| <b>Ground - Annual Testing</b>   |  | OK | Needs Repair | Notes: |
| <b>Check grounding connections.*</b>   |  |    |              |        |
| <b>Check nearby metal objects.</b>   |  |    |              |        |
| <ul style="list-style-type: none"> <li>Make sure metal bleachers and other metal objects are located at least 6' from the electrical components.</li> <li>Metal objects, such as bleachers, must have their own individual grounding system.</li> </ul>  |  |    |              |        |

\* These tests and/or repairs require the services of a qualified electrician.





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For additional information contact:  
LITTLE LEAGUE® INTERNATIONAL  
**PO Box 3485**  
**Williamsport, PA 17701**  
**570/326-1921**  
**Fax: 570/326-1074**

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